Assessing Market Segmentation Success: Developing a *Plan, Fieldwork, Action* Approach

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A Thesis
Submitted for the Qualification of Doctor of Philosophy
Warwick Business School, University of Warwick, UK

April, 1996

Declaration

This is to declare that:

- I am responsible for the work submitted in this thesis.
- This work has been written by me.
- All verbatim extracts have been distinguished and the sources specifically acknowledged.
- An earlier version of the part of the thesis, "Key Success Factors: Ensuring Effective Segmentation," was presented as a working paper at the European Marketing Academy, EMAC Conference, The Seventh Colloquium for Doctoral Students in Marketing, Maastricht, The Netherlands, 15-17 May, 1994.
- This work has not previously been submitted within a degree programme at this or any other institution.

Signature: Lin Meng-Jen

Date: 10 May 1996

Acknowledgements

This thesis would not have been accomplished without the support of many people so I owe them much gratitude.

I am most grateful for the support and participation of the hundreds of practitioners who were involved in the interviews and questionnaire responses, although public acknowledgements to each are not possible here.

I should like to extend my gratitude to many friends for their assistance in one way or another with my research: Tsair-Yuan Chang, Ting-Jui Chou, Shih-Chang Hung, Chai-Yun Huang, Chien-Kun Lin, Lee-Hsuan Lin, Carlos Monteiro, Thomas Murakami, Jih-Hsin Sher, Ching-Hua Teng, Miki Toyoma and Yau-Sheng Tsai.

Many thanks go to colleagues at the Warwick Business School, for the fun we shared at the cinema, pub, football pitch, golf course, ice rink, and volleyball court. These activities provided indispensable relaxation during the long haul of the study. These friends include: Rachel Allen, Thomas Cooper, Irena Grugulis, Jane Parker, Laura Read, Graham Sadler, Julian Tice and many others. Special thanks go to Roger A. Courtenay, the Great Master, for the tea, riddles and English lessons. It was very nice to share the WBS PhD story with all of them.

My English tutor, David Hardy, patiently went over the whole manuscript and picked up innumerable errors to make the thesis read much better.

The help of Margaret Armitage, Jason Cooper, Charles Handley and Wendy Murray from the Warwick Computing Service in the design of the questionnaire and the computerising of the data saved numerous hours in the data preparation for the research. I am also grateful to many academics for the informal discussion which generated many ideas for the research. These include Maureen FitzGerald, Phillip Howells, Maureen Meadows, Lyndon Simkin and Phil Stern of WBS, Professor Geoff Easton at Lancaster University and Professor Rainhard Angelmar at INSEAD, France.

I am especially indebted to Mel Hirst for the "Advanced Theory of Marketing" course, and the constructive criticism he gave for the design of the questionnaire. In addition, from time to time I gratefully discovered some segmentation-related information in my pigeon hole. I know it must have been from him.

Very special thanks go to Dr Sally Dibb, my first supervisor, for the sheer excellence of her supervision. On numerous occasions she, together with Professor Robin Wensley, my second supervisor, provided insightful comments to the research. While I was in the process of writing, they both closely followed the progress of the manuscript as it evolved.

On the home front, my sisters and brother have been most supportive. I should like to express my most sincere appreciation to my parents, for their encouragement and forbearance during this seemingly never-ending PhD study. Finally, my deepest gratitude goes to my wife, Chiung-Yao Chen, for all the love, support and patience she has given me and, also, to our children, Henry and Alice, who have provided an incomparable incentive through the frequent international phone calls: "*Daddy, we miss you. When are you going to finish your study and come home?*"

Abstract

Assessing Market Segmentation Success: Developing a *Plan, Fieldwork, Action* Approach

By Meng-Yen Lin, University of Warwick, UK, April, 1996

Market segmentation practice has been one of the central issues in marketing research over the past thirty years. However, the results of many segmentation studies have been unworkable from a business stand-point. This research was concerned with understanding what makes some market segmentation projects more successful than others. The purpose was to examine the relationship between possible success factors and the success of a segmentation project. The processes of the research included: identifying a range of factors which may impact on the success of market segmentation; hypothesising and testing relationships between these factors and market segmentation success; developing the *plan*, *fieldwork*, *action* (***PFA***) model for assessing market segmentation success; and generating recommendations for relevant modifications that will improve the odds of market segmentation success.

The research proceeded in a series of three interrelated phases: qualitative first, quantitative next, and then qualitative again. In the *first* phase, an initial list of the critical factors for segmentation success was generated through a review of the literature. The list was then validated and expanded by pilot interviews with marketing managers. In the *second* phase, a questionnaire was developed for gathering the necessary empirical data. 600 questionnaires were handed out at the Birmingham National Exhibition Centre at eight different trade shows. 221 usable responses were returned. Using the SPSS package, univariate, bivariate as well as multivariate statistics were employed to analyse the data. *Lastly*, validating interviews were conducted in an attempt to explain the research findings.

Ten factors believed to impact upon segmentation success were extracted. Seven of them were found to be critical to segmentation success and were termed *critical success factors* (CSFs). In addition, the research also identified the *plan*, *fieldwork* and *action* (PFA) stages in the segmentation process which led to the development of the ***PFA*** model. The model can be used to explain why some segmentation projects are successful while others are not. It was found that the *plan* and *action* stages were those most likely to impact upon segmentation success. The managerial implications of the research findings were discussed and suggestions for further research were proposed.

Key words: market segmentation, segmentation success, critical success factor, modelling, ***PFA*** model

博士論文摘要

評估市場區隔研究之成敗：*計劃 (Plan)－資訊收集 (Fieldwork)－執行 (Action)*模式 (*PFA* model) 之發展

林孟彥，University of Warwick, UK, April, 1996

多年來，市場區隔一直是行銷研究的重點之一。然而從實務的觀點來看，很多市場區隔專案的研究結果，經常是窒礙難行，而無法落實爲具體的行銷策略。本論文旨在探討市場區隔研究成敗的決定因素，研究的重點包括：

- 找出一系列和市場區隔研究成敗有關的因素；
- 建立假說、並檢定這些因素和市場區隔研究成敗間的關係；
- 發展一個*計劃 (Plan)－資訊收集 (Fieldwork)－執行 (Action)* 模式 (簡稱 ***PFA*** model)，來評估市場區隔研究專案的特性，並解釋該專案之所以成功或失敗的理由；
- 提供建議做爲市場區隔研究實施之參考，以提高市場區隔研究專案成功的機會。

本論文的進行分三階段：首先是藉由文獻探討及廠商訪談，找出一系列和市場區隔研究成敗有關的因素。其次，根據前階段的結果，發展出一份問卷以收集實證資料。本研究共發出六百份問卷，給在伯明翰英國國家商展中心參展的廠商，回收的 221 份有效問卷資料，再以 SPSS 統計軟體做各種必要的分析。研究的第三階段爲廠商訪談，其目的在驗證並解釋統計分析的結果。

本論文發現，有七個因素和市場區隔研究的成敗有顯著的相關，此七個因素可稱爲關鍵成功因素 (critical success factors)。此外，本研究並發展出一個*計劃 (Plan)－資訊收集 (Fieldwork)－執行 (Action)* 模式 (***PFA*** model)，此模式可用來評估、並解釋某一市場區隔專案成敗的原因。研究的結果顯示*計劃*與*執行*兩階段，與市場區隔研究的成敗特別有關，而值得廠商多加重視。

關鍵字：市場區隔，成功的區隔，關鍵成功因素，模式建立，***PFA*** 模式

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1. Introduction

1.1 Overview
1.2 Purpose of the Research
1.3 Research Hypotheses
1.4 Theoretical Rationale
1.5 Methodology
1.6 Research Scope
1.7 Significance of the Research
1.8 Organisation of the Thesis

"Most businesses that have been left behind, although all their activities may have borne a surface resemblance to those of their more successful rivals, lost out either because they failed to perfect the function in which the all-important KSFs [CSFs] *were to be found, or because, having recognized the KSFs, they lacked the thoroughness and persistence to exploit them fully."*

(Ohmae 1982: 49)

1.1 Overview

The ever increasing business competition over the past two decades and a simultaneous increase in consumer affluence have resulted in the need for businesses to recognise and cater for disparities in customer requirements. Yet, there are all kinds of customers in the market and it is almost impossible for a company, however big, to serve the needs of the whole market effectively. As a result, segmentation has become an important element in the development of marketing strategies since it helps marketers to choose their customer targets more precisely, and thus bridges the gap between diverse customer requirements and limited company resources.

During the past thirty years, a considerable number of studies have been published concerning the practice of the segmentation concept in the business world. As Wind (1978a: 315) notes, "In recent years one can hardly find an issue

of any of the leading marketing journals which does not include at least one article directly concerned with segmentation ..." Despite the popularity of segmentation research, however, the segments derived from many marketing studies have been unworkable from a business stand-point (Young *et al.* 1978: 405). In too many cases, segmentation studies are not practical enough to have a major impact on overall marketing performance (Weinstein 1994: 35). The consequences, as Tauber (1983: 7) observes, are useless reports which gather dust; those who fund the research become sceptics; and new ideas regarding ways to segment markets are harder to sell because managers no longer have the same level of confidence about segmentation as they had before.

Many researchers have explored the question relating to segmentation practices. Cheron and Kleinschmidt (1985: 102), for example, review different bases for segmenting a market and conclude that the implementation of certain segmentation approaches remains quite difficult. Plank (1985: 89) provides a critical review of the industrial market segmentation and finds that segmentation data interpretation and strategy implementation appear to be treated as an "art" in the minds of the practitioners. Wind (1978b: 333), after an extensive review of market segmentation literature, concludes that the most difficult aspect of any segmentation project is the translation of the study results into marketing strategy.

Taken together, while these reviews have shed light on our understanding of segmentation, there appear to be several deficiencies about the state of our knowledge concerning the segmentation concept and how it is practised. *First*, the main deficiency of segmentation studies is, perhaps, that it is difficult to see the wood for the trees. To date, most authors have chosen to focus on the detail of a segmentation project, that of designing segmentation studies and different approaches for grouping customers (Dibb & Simkin 1994: 56). As Percy (1976: 11) notes, every imaginable technique has been presented as a means of segmentation. However, few studies have attempted to investigate the overall success of a segmentation project, that is, using the whole segmentation process as

the research domain. Thus, we know much about the choice of bases and techniques for segmenting a market, but we have little understanding of how the whole segmentation project can be integrated to make it more successful.

Secondly, a significant amount of segmentation literature focuses only on one side of segmentation practice. That is, only the experience of successful segmentation projects is reported (e.g., Yankelovich 1964). Although Gross *et al.* (1993: 193) contend that we can often learn more from mistakes than from success stories, few, if any, studies have been published about the failure of segmentation practice. Therefore, it is by no means clear why segmentation projects which are unsuccessful have failed.

The *third* shortcoming of empirical work on segmentation is the tendency to look at only one set of factors and its effect on segmentation success. While a general view is gained of how important a specific variable, such as the choice of bases for grouping customers, is to the success of a segmentation project, no indication is obtained of the other possible factors that may have an effect on this success. Also, the relative importance of each factor is not clearly understood. A more comparative investigation of the variables would greatly improve our knowledge of segmentation success.

A *fourth* drawback relates to the measure of segmentation success. Most of the segmentation studies reviewed in the literature have used sales, profit, or market share as indicators of segmentation success. They treat success in these areas as surrogate measures of segmentation success. As little is known about the relationship between segmentation success and these surrogate measures, findings related to segmentation success from these studies may be biased.

Lastly, according to Emory (1980: 105), it is important for researchers to incorporate safeguards into the study design to ensure that possible extraneous variables do not confound the hypothesised relationships. While studying the factors that may have impact on segmentation success, most studies tend to ignore

the possible effects caused by extraneous variables (e.g., Wiseman 1971). Consequently, there may be errors regarding the relationship between independent and dependent variables in much of the reported research.

To sum up, the fact that segmentation is important in formulating marketing strategy and yet its implementation still relies heavily on intuition and trial and error, shows that there is a void in relation to segmentation implementation which urgently needs to be studied. Thus, for marketing practitioners, probably the most interesting question is about the conditions which determine success or failure in segmentation research (Haley 1984: 20). Indeed, it is this question which forms the crux of the research in this thesis.

1.2 Purpose of the Research

The purpose of this study is to examine the relationship between possible success factors and the success of a segmentation project. The *independent variables*, in this case the success factors, are the limited number of areas in which results, if satisfactory, will ensure successful competitive performance for the organisation (Rockart 1979: 85). The *dependent variables*, that is segmentation success, will be measured based on the subjective judgement of the practitioners who participated in the questionnaire survey and who have previously been involved in the implementation of a segmentation project in their organisations. While investigating the relationship between the independent and dependent variables, the *extraneous variables*, that is the demographic variables, will be statistically controlled in the study (see section 4.2 for more discussion about the variables).

The research process, comprising qualitative and quantitative methods, will include:

- Identifying a range of factors which may impact on the success of market segmentation (see section 2.2, section 4.3.2 & section 4.4.1).

- Hypothesising and testing relationships between these factors and market segmentation success (see section 5.3 & section 6.1).
- Developing the *plan*, *fieldwork*, *action* (***PFA***) model for assessing market segmentation success (see section 6.4).
- Generating recommendations for relevant modifications that will improve the odds of market segmentation success (see section 7.3).

1.3 Research Hypotheses

> *"... hypothesis statements contain two or more variables that are measurable or potentially measurable and that they specify how the variables are related."*
>
> *(Kerlinger 1986: 17)*

Hypotheses to be tested in this research relate to three levels. They are: the segmentation activity level, the success factor level and the ***PFA*** stage level. At the *first* level, the relationships between thirty one segmentation activities believed to be important to segmentation implementation and segmentation success are hypothesised (see Q.26 of the questionnaire in Appendix 4). At the *second* level, the hypotheses are to test the relationships between the ten success factors generated by the factor analysis (see section 5.2.6) and the segmentation success. At the *third* level, the hypotheses are to test the relationships between the three stages (*plan*, *fieldwork* and *action*) developed in the research (see section 6.1) and segmentation success.

Miller (1970: 4) suggests that the hypotheses selected for testing be clearly stated. For completeness sake, the three levels of hypotheses are listed here. However, as the research will place more emphasis on the development of a model rather than on the testing of the hypotheses, this research will not repeatedly revisit to these hypotheses. Also, in the interests of being concise, it is not necessary to list all of the hypotheses here. Thus, only the first null hypothesis of each level is presented.

- $H_{0\ A\text{-}1}$: the more that formal and agreed procedures are used for conducting a segmentation project, the more likely that the segmentation project will be successful (see section 5.3).
- $H_{0\ B\text{-}1}$: the better the quality of the segmentation project results, the more likely that the segmentation project will be successful (see section 5.3 & section 6.1).
- $H_{0\ C\text{-}1}$: the more *plan* strongly-oriented the segmentation project, the more likely that the segmentation project will be successful (see section 6.3).

1.4 Theoretical Rationale

In formulating a theoretical perspective for studying the relationship between possible success factors and the success of a segmentation project, the *critical success factor* (CSF) approach provides a useful tool. Critical success factors are those main areas in which things must go right for the company to be successful. They are the areas that management must constantly monitor to ensure that the results are successful.

The CSF approach was first introduced by Rockart (1979) in the discipline of management information systems. The CSF concept of focusing on a limited number of important priorities has been a useful management tool in many different areas. The reason for applying the approach to this research is that the researcher believes that coping with segmentation difficulties and finding a way to ensure successful implementation depends on identifying the CSFs of a segmentation project and then dealing with them properly so that performance in those areas proceeds exceedingly well. By identifying and explaining the factors which affect the success of a segmentation project, companies should be able to gain a better understanding of why some segmentation practices are successful and others are not, and make the best use of this marketing concept to their advantage. A more detailed discussion of adopting the CSF approach can be seen in section 2.4.

1.5 Methodology

Since the research plans to tackle segmentation problems from the implementation perspective, an empirical survey is conducted to collect the relevant data. The methodology employed in this research consists of three phases. *To begin with*, after a review of the literature, an initial list of CSFs was generated. To test both the validity and comprehensive nature of these CSFs it was decided that interviews with academics as well as marketing managers were needed. Therefore, a pilot interview checklist - covering questions like company background, segmentation planning and implementation issues - was compiled to help streamline the interview procedure. Through face-to-face interviews, much information about the respondents' perception of the essence of a successful segmentation project was revealed. *Secondly*, information gleaned from the literature and the responses from interviews served as the foundation for the development of the questionnaire, which was later used as the measuring instrument of the research. The questionnaire asked respondents for general information about their companies, their perception of segmentation, and their experience related to a specific segmentation project. 600 questionnaires were delivered at the Birmingham National Exhibition Centre (NEC) at eight different trade shows. 221 usable questionnaires were gathered. The data were entered onto the computer and analysed using the SPSS software package. Descriptive statistics such as means and standard deviations, as well as multivariate analysis such as factor analysis and cluster analysis, were utilised to analyse the data. *Lastly*, validating interviews were conducted. The research methodologies employed will be explained in greater detail in Chapter Four.

1.6 Research Scope

The following two delimitations have served as the boundaries for the research scope. *First*, this research confined itself to investigating companies participating in eight trade fairs at the NEC in Birmingham. That is, the research

population was limited to immediate participants at the NEC trade fairs, although some of the participants may not have been on site but may then have been given copies of the questionnaire by colleagues who received them from the researcher. The reasons for choosing the eight trade fairs from the NEC will be explained in more detail in section 4.6.3. *Secondly*, there may be many possible factors, such as the personality of the marketing manager, the leadership style of the company, etc., that can affect the success of a segmentation project. However, this research has concentrated only on the activities directly related to a segmentation project. That is, factors that the researcher cannot prove, either from the literature or from the interview responses, to have a direct influence on segmentation success have not been included in the design of the questionnaire. A more detailed discussion of the success factors can be found in section 2.2.

1.7 Significance of the Research

The search for the critical factors for segmentation success is important for several reasons. *First*, investigating the relationships between the CSFs of a segmentation project and its success can help to uncover areas that are important to the implementation of segmentation strategy. Management can then more effectively focus attention on these areas to try and ensure the success of a segmentation project. *Secondly*, the success factors identified in this study can potentially be used as a checklist for practitioners in preparing and implementing a segmentation project. *Thirdly*, the comparative study between successful and unsuccessful segmentation projects will be able to contribute much to our understanding of segmentation success as well as helping companies to learn from the experience of successful ones and avoid the mistakes of the unsuccessful ones. *Fourthly*, the efforts made in this research to develop a measure for segmentation success can be used as a foundation to construct a more accurate measure. *Finally*, this research adopts a survey approach to collect empirical data about segmentation implementation. Findings from this research will not only broaden

our understanding of the practical use of market segmentation but also help bridge the gap between normative segmentation theory and its real-world practice.

1.8 Organisation of the Thesis

There are seven chapters in the thesis. Chapter One presents an overview of the research problem. The purpose and research hypotheses are introduced. The theoretical rationale of the research is outlined. The methodology, research scope, and significance of the research are discussed.

Chapter Two reviews previous segmentation research and relevant literature. The chapter begins by tracing the evolution of the segmentation concept. Then, its definition, process, criteria, benefits, limitations, bases, and implementation issues are reviewed. Factors important to segmentation success and the measuring of segmentation success are highlighted. In the last section, the critical success factor approach is introduced to relate the independent variables and dependent variables of the research.

Chapter Three reviews all of the statistical techniques employed in this study for analysing the questionnaire data. There are six sections in this chapter. Section one is a brief review of the basic procedures for testing hypotheses. Section two discusses the importance of underlying assumptions for testing hypotheses. Sections three to five deal with the analytical techniques used in the research, including univariate, bivariate and multivariate statistics. Although these techniques can be used in different ways, and there are many issues related to their usage, only the topics which are relevant to this research are investigated. The last section is the summary of Chapter Three.

Chapter Four examines the methodology employed in this research. The approaches used to tackle the research problem are discussed. The variables in the research are introduced. The research design includes three phases. The *first* phase involves qualitative research to identify factors which may impact on the

success of segmentation. In the *second* phase, a large-scale questionnaire survey is used to gather the data needed for testing the research hypotheses. The *third* phase consists of validating interviews for justifying the research results.

Chapter Five presents the analysis results of the data collected from the questionnaires. The independent variables are condensed by factor analysis and ten factors believed to impact upon segmentation success are extracted. Then, *Student's t* tests are used to test if significant differences exist between the *lower-half* and *upper-half* of the samples, in terms of each extracted factor. Significant differences between the two groups are found in seven of the ten factors. These seven factors are considered to be critical to segmentation success.

Based on the ten factors identified in the previous chapter, Chapter Six goes a step further to reverse check the relationships between the independent and dependent variables of the research. This reverse check results in the identification of three distinct stages in the segmentation process. They are the *plan*, *fieldwork* and *action* stages. These three stages are used as bases for clustering the samples into different groups to investigate the impact of each stage on segmentation success. The investigation leads to the development of the *plan*, *fieldwork* and *action* (***PFA***) model. The ***PFA*** model can be used to explain the relationships between each stage and the success of a segmentation project.

Chapter Seven is the conclusion, presenting a brief summary of the research. The contributions and managerial implications of the research findings are discussed. A critique of the work conducted and suggestions for further research are provided.

Finally, the pilot interview checklist, correspondence letters, the questionnaire of the research, additional hypotheses testing, and the summary report for sending to questionnaire respondents are presented in the Appendices.

2. Literature Review

2.1 Overview of Segmentation
2.2 Factors Important to Segmentation Success
2.3 Measuring Success
2.4 The Critical Success Factor Approach
2.5 Summary

This chapter presents a review of relevant literature, with several purposes. *First*, it shares with the reader the results of other studies that are closely related to the current research. *Secondly*, it relates this research to the larger, ongoing dialogue in the literature about segmentation success. *Thirdly*, it provides a structure for establishing the importance of the research, as well as a benchmark for comparing the results of the research with other findings.

Facing the huge amount of market segmentation literature, it was difficult to determine how much literature to review when composing this chapter. To address this problem, Creswell (1994: 28) suggests that a literature review chapter contains "*sections about the literature related to major independent variables, major dependent variables and studies that relate the independent and dependent variables.*" This framework seems well suited for this research. Therefore, this chapter starts with an overview of market segmentation. Then following Creswell's proposal, it continues with sections which cover: factors important to segmentation success, measuring success, and the critical success factor approach.

2.1 Overview of Segmentation

Over the years, the concept of market segmentation has generated a proliferation of papers covering a wide range of issues such as new bases for segmenting a market, new statistical techniques for analysing customer data, application of segmentation in all sorts of industries, and so on. This section gives

a brief review of the evolution, definition, process, criteria, benefit, limitations, bases and implementation of segmentation.

2.1.1 Evolution of Segmentation

> *"... if the elasticities of demand* [of individuals] *are different he* [the monopolist] *will first divide all individual buyers into two classes such that the highest elasticity of demand in the one class is less than the least elasticity of demand in the other class. To the first class he will raise the price, and to the second class he will lower it."*
>
> *(Robinson 1933: 186)*[1]

The original concept of market segmentation can be traced back to Chamberlin's theory of monopolistic competition (1933), and the imperfect competition theory of Robinson (1933). Both authors recognise the heterogeneity of demand and the possibility of several demand curves for separate markets. As Robinson (1933: 179-202) concludes, a firm selling a homogeneous product in a market characterised by heterogeneous demand could maximise profits by charging different prices in different markets. The price discrimination concept adopted from economic theory has grown, developed and eventually blossomed into market segmentation theory in the literature.

Frederick (1934: 22) proposes that "The first step in analysing an industrial market is to divide the whole market into its component parts." He defines a ***component market*** as "any particular group of prospective or present users of a product to whom a concentrated advertising and sales appeal may be made." Dean (1949: 521) notes that ***market segmentation*** involves "*breaking up the market into sectors that differ in price elasticity of demand so that different price can profitably be charged in different sectors.*" Despite the fact that Dean used

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[1] This quest for the origin of the market segmentation concept was inspired by Mel Hirst in a discussion at Warwick Business School in 1993.

the term in 1949, Smith (1956: 5) is widely recognised as the one who first coined the term *market segmentation* (e.g., Barnett 1969: 152; Frank 1968: 39; Lunn 1986: 387; Michman 1971: 322; Reynolds 1965: 107; Winter 1982: 19). Obviously, Smith was not the first, but one of the pioneers in this field. He looks at market segmentation and product differentiation as alternative strategies and defines *market segmentation* as "a rational and more precise adjustment of product and marketing effort to consumer or user requirements."

Since the 1950s, the importance of segmentation has been widely recognised (e.g., *Marketing News* 1986; Waldo 1973). Many of the new analytical techniques proposed in marketing have been applied to and tested in the segmentation area and segmentation research has been popularly adopted across a variety of industry settings (e.g., Bahn & Granzin 1986; Cermak *et al.* 1994; Morgan 1978; Muller 1991; Yavas *et al.* 1992).

2.1.2 Segments and Segmentation

Though the term "niche" is sometimes used to mean the same as "segment" (Powers 1991: 140), a *niche* is a more narrowly defined group that may seek a special combination of benefits (Kotler 1994: 267). Generally speaking, *segment* is more widely accepted in the market segmentation literature. According to Wind and Cardozo (1974: 155), a *market segment* is "a group of present or potential customers with some common characteristic which is relevant in explaining (and predicting) their response to a supplier's marketing stimuli."

As for market segmentation, as Plank (1985: 80) points out, a glance through the literature shows a lack of agreement in the use of the term "market segmentation." There appear to be two separate schools of thought. A widely accepted definition of market segmentation is presented by Kotler (1991: 263). He sees market segmentation as one of the three steps in target marketing and defines *market segmentation* as "*the act of dividing a market into distinct groups of buyers who might require separate products and/or marketing mixes.*" Another

school of thought (e.g., Pride & Ferrell 1989; Schiffman & Kanuk 1994) views segmentation as a process which not only defines the segments, but also allocates resources to them.

> *"Market segmentation can be defined as the process of dividing a potential market into distinct subsets of consumers with common needs or characteristics and selecting one or more segments to target with a distinct marketing mix."*
>
> *(Schiffman & Kanuk 1994: 47)*

Obviously, there is no clear end to the process which can be used to define the scope of market segmentation. However, Mahajan and Jain (1978: 339) argue that market segmentation and resource allocation are closely intertwined and cannot be separated. It would be meaningless to develop market segments which cannot be serviced with the available corporate resources or available marketing tools. Therefore, the decision of which segments are to be served should be embedded in the overall resource allocation decision.

2.1.3 The Segmentation Process

In addition to the lack of agreement about the definition of market segmentation, there is also a lack of consensus about the process of how segmentation is put into practice. Most academics (e.g., Coles & Culley 1986: 54; Kotler 1991: 263) believe that market segmentation is implemented in three sequential steps, known as ***STP*** marketing. These are *market segmentation*, where customers with homogenous requirements are grouped according to appropriate variables; *market targeting*, involving decisions about the segments on which marketing effort is to be focused; and *product positioning*, considering how best to aim the product and marketing programme at the identified segments.

Yet, some scholars seem to suggest the segmentation process as having a *segmenting*, *positioning* and *targeting* sequence. For example, Cravens *et al.* (1976: 246-247) argue that the process of segmentation involves management in: (1) seeking bases upon which markets can be segmented, (2) understanding

customers comprising each segment, (3) forecasting market potential within each segment, (4) determining the proportion of demand that can be captured by the firm, and in the meantime, determining the cost of serving the segments (5) assessing the potential for the achievement of corporate goals and objectives in each segment, (6) determining the selection of specific segments as market targets. In addition, Hooley and Saunders (1993) view targeting as an outcome of segmentation and positioning research.

> *"The final part ... looks at implementation of competitive positioning strategies. ... discusses ways of* ***selecting market targets*** *from those uncovered through segmentation and positioning research."*
>
> *(Hooley & Saunders 1993: 187)*

In these two examples, *targeting* seems to be the last stage in the segmentation process.

It is not the researcher's intention to decide which sequence is more logical. This discussion is purely to show the diverse opinions in the market segmentation literature, even on such a fundamental issue.

2.1.4 Criteria for Segmentation

As discussed above, a market segment is a meaningful buyer group and the process of market segmentation is a customer-approach designed to identify and serve segments. However, not all segments present marketing opportunities. To be meaningful, market segments must satisfy the five criteria proposed by Kotler (1994: 280-281). They must be *measurable,* such that the size, purchasing power and profile of the segments can be measured; *substantial*, such that the segments are large and profitable enough to serve; *accessible*, such that the segments can be effectively reached and served; *differentiable*, such that the segments are conceptually distinguishable and respond differently to different marketing mix elements and programmes; and *actionable*, such that effective programmes can be formulated for attracting and serving the segments.

2.1.5 Benefits and Limitations of Segmentation

Segmentation, in general, can help businesses in *market analysis*: to understand better the total marketplace as well as how and why customers buy; *market selection:* to select for marketing attention those segments that best fit the company's competence; and *marketing management*: to facilitate the development of strategies, plans, and programmes to meet profitably the needs of different segments as well as providing the company with a distinctive competitive advantage (Bonoma & Shapiro 1983: 1-2).

In short, market segmentation enables companies to gain a better overview of the market and helps them take advantage of opportunities which might not otherwise be available to them. The benefits of segmentation can be well illustrated by the following two examples:

- Yankelovich (1964: 84-86) presents the case of the Timex Company, which applied benefit segmentation to the purchase of watches and successfully led to Timex becoming one of the world's largest watch companies.
- Wind and Cardozo (1974: 159) describe the case of a spray painting and finishing equipment marketer, which, having a new system to offer, divided the market into different macrosegments on the basis of Standard Industrial Classification (SIC) category, size of buying firm and location, then developed distinctive strategies for the identified segments. Later, the company successfully penetrated the markets which were previously dominated by competitors.

These two examples clearly show that companies can profit from making the best use of segmentation in their marketing strategy.

Despite the many advantages, however, a marketer should be aware of the limitations of market segmentation. *First*, the great diversity of consumer lifestyles in recent years has made segmentation more difficult in many markets

(Weinstein 1994: 11). The increase in the numbers of women in the labour force, increase in divorce and single person households, and today's changing lifestyles (e.g., convenience-seeking, health and fitness consciousness, etc.) have made the market increasingly complex and difficult to understand. *Secondly*, segmentation findings only provide a composite profile of a group (Weinstein 1987: 12). Although research can provide meaningful marketing information, segmentation analysis may reflect only certain aspects of consumer characteristics which do not necessarily indicate individual purchase behaviour. For example, two men may both be thirty-five years old, college educated, and earn the same salary. By using demographic analysis only, the marketer may falsely categorise these consumers as similar prospects. In reality, they may have different interests, attitudes, and perspectives on life. *Thirdly*, a segmentation-based strategy may be risky (Bell & Vincze 1988: 307). Putting all one's eggs in one basket restricts a company from taking advantage of growth opportunities in an un-targeted market. In addition, focusing too much on a specific segment may make a company particularly vulnerable to a successful competitive attack. *Fourthly*, segmentation research is not a remedy for other marketing or organisation deficiencies (Weinstein 1994: 11). The best segmentation information is worthless unless it is supported by consistent product, pricing, promotional, and distribution strategies. Also, market segmentation strategies are not a panacea for other potential organisational limitations. *Finally*, a good segmentation plan is only as good as the ability of the company to implement it (Plank 1985: 90). The successful implementation of a segmentation project requires action programmes in all functional departments to focus on supplying the needs and requirements of the targeted market segments (Hlavacek & Ames 1986: 49). Therefore, unless the segmentation approach is well understood and appreciated in the company, application of the strategy could have only minimal results (Engel *et al.* 1972: 3).

Besides, it should be noted that there are situations where segmentation is not useful (Young *et al.* 1978: 405). *One* situation is where the market is so small that marketing to a portion of it is not profitable. Here, the low usage of a product

makes it possible for the market to sustain successfully only one or two brands. Therefore, marketing strategy is based on analysing the whole market rather than segments. A *second* situation is where heavy users make up such a large proportion of the sales volume that they are the only relevant target. Marketing efforts, therefore, must be directed only at this group. The *last* situation is where the brand is the dominant brand in the market. The demand for the product comes from all segments, hence, it would not be beneficial to target a marketing programme to only one or two segments.

2.1.6 Bases of Segmentation

> *"Market segments can be carved out in several dimensions, e.g.,* [by] *geographic areas, by sub-products, by use of the product, by distribution channels, by sensitivity to price, by size of customer, and so forth."*
>
> *(Dean 1951: 160)*

To segment a market, a marketer needs first to have a base, such as age, sex, or income, by which the customers can be allocated to different groups. A base is a customer characteristic which relates to the important differences in customer responses to marketing offerings, such as price, brand, and product quality.

For consumer markets, many bases can be used to segment markets. Dibb *et al.* (1994: 72) divide the bases into two categories: basic customer characteristics and product related behavioural characteristics. This framework can be broken down to the structure shown in Table 2-1. Also included in the Table are references which cover the use of these particular bases in the literature.

Table 2-1 Segmentation Bases for Consumer Markets

Classification	Segmentation Bases	References
Basic Customer Characteristics		
Geographics	Climate	• Kotler *et al.* 1996: 357
	Region	• Beane & Ennis 1987: 21
	Urban	
	Geodemographics	• Baker 1989; Johnson 1989; Rothman 1989: 1
	Nation	• Chisnall 1985: 267; Douglas & Craig 1983: 14; Nachum 1994: 62-63
Demographics	Age	• Kotler 1994: 180
	Gender	• Kotler 1991: 270; Dibb *et al.* 1994: 73
	Family Life Cycle	• Kotler 1994: 180-181
	Race and Religion	• Feldman & Star 1968
Psychographics	Personality	• Foxall & Goldsmith 1988; Haire 1950; Villani 1975
	Perceived Risk	• Peter & Ryan 1976: 187
	Reference Groups	• Venkatesan 1966
	Attitude	• Engel *et al.* 1993: 321
	Lifestyle	• Plummer 1974
Socioeconomics	Education, Occupation, Income and Social Class	• Coleman 1961; Schiffman & Kanuk 1994: 387-390
Product Related Behavioural Characteristics		
	Purchase Occasion	• Schiffman & Kanuk 1994: 69
	Benefits Sought	• Greenberg & McDonald 1989; Haley 1968
	Usage Rate	• Twedt 1964
	Brand Loyalty	• Frank 1967; Starr & Rubinson 1978
Other		
	Astrology	• Mitchell 1995
	Time	• Darian & Cohen 1995

For industrial markets, in addition to many of the same bases employed in consumer market segmentation, some new bases emerge. Shapiro and Bonoma (1984) propose the following classification of segmentation bases for the industrial market shown in Table 2-2. They suggest that the demographic bases

are the most important, followed by the operating variables - down to the personal characteristics of the buyer.

Table 2-2 Segmentation Bases for Industrial Markets

Classification	Segmentation Bases
Demographics	Industry
	Company Size
	Customer Location
Operating Variables	Company Technology
	Product & Brand-use Status
	Customer Capabilities
Purchasing Approaches	Purchasing-Function Organisation
	Power Structures
	Buyer-Seller Relationships
	General Purchasing Policies
	Purchasing Criteria
Situational Factors	Urgency of Order Fulfilment
	Product Application
	Size of Order
Buyers' Personal Characteristics	Buyer-Seller Similarity
	Buyer Motivation
	Individual Perceptions
	Risk-Management Strategies

Source: Adapted from Shapiro and Bonoma (1984: 105-109)

Whatever the base, or combination of bases, used to group customers, it is inevitable that a more comprehensive understanding of what those individuals are like will be needed. As suggested by Bell and Vincze (1988: 291), a segment must be clearly defined to be the foundation for marketing strategy. The more comprehensive the image developed, the better the opportunity to develop an effective marketing mix with maximum appeal. This process of building up a fuller picture of target segments is sometimes called *profiling*, and the variables used in the description are termed *descriptors* (Dibb *et al.* 1991: 90).

The data gathered from profiling allow measurements to be made of the size and importance of the segment as a potential object of marketing strategy. Unfortunately, obtaining segment data is seldom easy, especially when the

segment is defined in terms of behavioural characteristics (Bell & Vincze 1988: 291).

2.1.7 Implementation of Segmentation

> *"In spite of the many advances made in market segmentation methodology, a majority of firms, both large and small, base their marketing strategies and tactics primarily on cursory or intuitive analyses of their potential markets."*
>
> *(Weinstein 1987: xi)*

While the concept of market segmentation has been widely accepted, the process for successfully identifying segments remains far from straightforward (Moriarty & Reibstein 1986: 463). Experience from actual attempts to apply the process has been mixed (Cravens *et al.* 1976: 251). There are many successful applications by firms including Du Pont (Coles & Culley 1986: 56-58), Hartford (Wood & Ehrlich 1991: 59), Timex Watches (Yankelovich 1964: 84-86), and so on. In these cases, all of the companies successfully launched new products and marketing mixes which closely met the needs of targeted markets and enjoyed fruitful profit.

However, there have also been difficulties reported (Frank & Green 1968: 83; Robertson & Barich 1992: 5). For example, Wind (1978b: 333) argues that the most difficult aspect of any segmentation project is the translation of the study results into marketing strategy. Cravens *et al.* (1976: 252) add another difficulty, that of identifying customer response elasticities and characteristics. The reasons for these difficulties are that there is a big gap between research data and marketing recommendations and that it takes a lot of thinking and action before knowledge of one's customers can be turned into a calculated competitive strategy (Foote 1969: 29). As a result, even if a proven method is properly followed, there is no assurance that the output would be used correctly (Achenbaum 1974: 11).

The practice of segmentation is still in a primitive stage. As O'Shaughnessy (1988: 117) observes, when choosing bases for segmenting the market, companies

tend to use intuition, experience, and trial and error. He comments that many marketing managers have a feel for the market - an empathetic understanding whereby they "know" that such a demographic, psychographic or behavioural variable distinguishes segments. He contends that, by trial and error, marketing managers can break down a market into partitions or divisions based on product attributes and check whether such divisions are meaningful in terms of market behaviour. In addition, Dibb and Simkin (1994: 56-57) point out that many companies base their selection of segmentation variables on the ease of implementation rather than the appropriateness of resulting schemes.

2.2 Factors Important to Segmentation Success

A brief overview shows that market segmentation, if properly used, can give competitive edge to a company. It enables a company to divide the whole market into relatively homogeneous segments on the basis of geographic, demographic, psychographic, socioeconomic or product related behavioural variables. These characteristics are relevant in explaining and in predicting the response of consumers, in a given segment, to the specific marketing stimuli a company offers. Once a segment has been identified which fulfils the *measurable*, *substantial*, *accessible*, *differentiable* and *actionable* criteria, it is possible to develop a product or service and marketing mix to meet the needs of the segment. While implementing segmentation, there are many factors which can be attributed to the success of a segmentation project. In the literature, the following factors have been described.

2.2.1 Well Designed Planning

> *"One of the most important factors in determining whether a segmentation study will provide the desired results is the planning and research framework upon which the information will be gathered, analysed and evaluated."*
>
> *(Weinstein 1987: 37)*

Having a plan is important because it not only gives a company direction but also serves as the basis for resource allocating, budgeting, scheduling and controlling. A segmentation plan is a blueprint for systematic data collection, analysis, understanding market situations, and taking action to fill the needs of targeted markets.

On one hand, as Weinstein (1994: 45) contends, the success of a market segmentation programme depends on the planning process employed in designing, collecting, and analysing relevant customer information. For segmentation analysis to be effective, it can be accomplished by using systematic planning frameworks (e.g., Bell & Vincze 1988: 63-76; Weinstein 1994: 38), soliciting the involvement of management at all levels within the company, and using appropriate analytical methods. The result of such efforts then should be segmentation findings that are readily translated into marketing strategy. On the other hand, successful implementation of plans means overcoming the many stumbling blocks that may exist in the company. These obstacles, as McDonald (1989b) identified, can range from isolating the marketing function from operations to hostile corporate culture. Successful implementation of marketing plans calls for these barriers to be removed by committed senior management backed by effective and well-integrated marketing systems.

2.2.2 Top Management Support

> *"For segmentation to be effective, however, the commitment of senior marketing management to such a policy is an absolute must."*
>
> *(Engel et al. 1972: 3)*

As Croft (1994: 11) argues, even the best thought out segmentation plans and ideas tend to falter without the active support of senior management. The reason for this is that attention to previously unrecognised market opportunities will usually require the allocation of additional company resources. Often it will demand that the company follow a different direction from that currently being

taken. Under these circumstances, unless the segmentation approach is well understood and supported by top management, the application of the strategy could have only minimal results. Besides, as Meredith and Mantel (1995: 127) contend, if the support is weak, some areas in the company may not be willing to give help when help is needed for the project. Therefore, it is important for top managers to get behind the project at the outset and make clear to all personnel involved that they support successful completion of the project (Meredith & Mantel 1995: 210).

2.2.3 Team Work

> *"Coordination, cooperation, and a close working relationship among the entire marketing team ... are vital to the success of a practical segmentation study."*
>
> *(Weinstein 1994: 36)*

Brown *et al.* (1989: 105) and Haley (1984: 20) suggest that the contributions of non-marketing departments and functions are central to market segmentation success. Taking into consideration the complexity of the whole segmentation process, it is important that marketing and non-marketing departments and functions work closely together (Mercer 1992: 263).

For the effective implementation of market segmentation strategies, Wind (1978b: 333) suggests that all the relevant users (e.g., product managers, new product developers, advertising agency personnel, etc.) should be involved in the problem definition, research design, and data interpretation stages of the segmentation research. Hlavacek and Ames (1986: 49) suggest that a cross-functional business plan, not just a marketing plan, must be adopted. The plan must contain action programmes in all functional departments to focus on supplying the needs and requirements of the targeted market segments.

As Greenberg and McDonald (1989: 33) argue, it is critical for the ultimate success of a segmentation project that all the people charged with implementing

the results, including marketing staff and ad agency personnel, participate in the process. The importance of a team-work approach toward segmentation success cannot be overemphasised.

2.2.4 Choice of Segmentation Bases

> *"There are lots of ways to segment market needs. The right way is a powerful tool for beating the competition."*
>
> *(Coles & Culley 1986: 52)*

The purpose of choosing segmentation bases is to group customers based on differences or similarities. The key task is finding customers that are similar in some attributes within groups but different from those in other groups. To date, a large proportion of the segmentation literature has focused on finding proper bases for segmentation (e.g., Choffray & Lilien 1980; Darian & Cohen 1995; Dowling *et al.* 1993; Gonzalez-Arce 1975; Gottlieb 1958; Wells 1968). The choice of some bases, as Doyle and Saunders (1985: 25) observed, tends to be more likely to be successful than others. However, in selecting the most appropriate way to segment a particular market, it is rarely clear at the start which approach will give the best insight into the market.

The choice of bases involves a great deal of judgement (Coles & Culley 1986: 54; Webster 1991: 99). As Haley (1984: 20) argues, there is a variety of ways in which markets can be segmented productively. It is advisable to try different bases (such as geographic area, desire sought, etc.) and then choose the one that is most meaningful and appropriate (Young *et al.* 1978: 407). Greenberg and McDonald (1989: 30) suggest that, in practical terms, the dimensions chosen as a basis for segmentation should: correlate with market behaviour; lead readily to product manipulation and development of message strategies; and provide direction for media buying.

2.2.5 Knowledge of Target Markets

> *"... a more comprehensive understanding of what those individuals are like will be needed. ... The more comprehensive the image developed, the better the opportunity to develop an effective marketing mix with maximum appeal."*
>
> *(Dibb et al. 1991: 90)*

Successful segmentation implementation requires information about potential target markets and their possible responses to various marketing actions, competition, and other uncontrollable factors. Without good marketing information, managers have little to do but to operate on intuition or guesses. As McCarthy and Perreault (1984: 137) argue, such an approach to dealing with business, in this dynamic and highly competitive economy, invites failure.

Once the market has been divided into different groups, each customer segment that a company considers targeting should be profiled in more detail. It is not enough to consider, say, price-sensitive customers versus quality-sensitive customers. Further segment descriptors, such as their demographics, psychographics, mediagraphics, attitudes, behaviour and desired product benefits variables are needed so that sensible marketing mixes can be developed to meet customers' preferences (Grover & Srinivasan 1987: 148; Kotler 1991: 277).

A successful example of a company which understands its market thoroughly is the TSB (Trustee Savings Bank). TSB has a project team dedicated to identifying market segments, studying customers' needs and developing products to fill the needs of its customers. The team analyses its customer's profile and the special features of each group of customers. In this way it has identified the potential of the elderly segment of its market and then successfully created tailor-made products for their very distinct and special needs (Mcburnie & Clutterbuck 1988: 133).

Besides understanding its customers, it is also important for the company to understand how its strengths and weaknesses compare with those of its key

competitors on the essential attributes for each segment (Robertson & Barich 1992: 9). This knowledge enables a company to identify those segments that offer the best chances of success in relation to the company's strength and situation determinants. The company can then go to the next stage of selecting its target markets and then allocate its marketing resources to develop marketing mixes tailored to the specific needs of the targeted market in the most effective and efficient way.

2.2.6 Selection of Target Markets

> *"The success of Crown Cork after 1956 can be attributed to a wide range of actions, ... At the heart of its success, however, are the choices management made with regard to markets ... Choice of market is a choice of the customer and of the competitive, technical, political, and social environments in which one elects to compete."*
>
> *(Corey 1975: 121)*

After the market has been segmented, the company then selects those segments that it aims to target. Webster (1991: 97) contends that the selection of customers to be dealt with and the markets to be served is the most important decision made by any business firm because commitment to serving the needs of those customers will shape the company's resources and skills, business strategy, and organisational structure.

The selection of target market should be based on careful analysis of markets and of company capabilities (Webster 1991: 98). Each of the individual segments must be evaluated on its own merits and in conjunction with the capabilities and environmental situation surrounding the company. The selection can be influenced by many factors, such as the importance of the target as it relates to the company's objectives, the potential of the opportunity that the target represents, the competition for the target, and the capacity of the company to develop a programme capable of reaching the target. The five criteria proposed by

Kotler (1994: 280-281; see section 2.1.4) should be used to guide the selection of target markets. In addition, three strategic choices suggested by Doyle (1994b: 68) can also be used for selecting target markets. *First*, by *undifferentiated marketing*, the company ignores actual or potential differences among segments and targets the entire market. *Secondly*, by *differentiated marketing*, the company seeks to compete across the majority of the market by developing different products and marketing programmes for each segment of the market. *Thirdly*, by *focused marketing*, the company does not aim to compete in the majority of a market; instead, it specialises in one segment or a small number of segments.

2.2.7 Integrated Approach

> *"For segmentation strategy to work effectively, it must be an integrated part of a company's marketing plan."*
>
> *(Weinstein 1987: 17)*

Market segmentation is not an activity that should be undertaken in isolation. As many have suggested, the development of market segments and marketing actions should be closely linked (Dean 1951: 515; Mahajan & Jain 1978: 339). Once the target markets have been selected and the background picture understood, the targets should form the basis of subsequent marketing actions. That is, segmentation findings should be incorporated into a company's marketing mix (*product*, *price*, *promotion* and *distribution*; 4 Ps) strategies.

According to Weinstein (1994: 208), the overall marketing strategy employed, which includes the manipulation of the marketing mixes, is the positioning aspect of segmentation implementation. Berrigan and Finkbeiner (1992: 150) contend that in the highly competitive arena of the 1990s, customers will be bombarded with messages designed to create preference for products and brands. A company having an objectively superior product may still lose its share because the competition creates a perception that its product is better. As Ries and Trout (1981: 2) note, "Positioning is not what you do to a product; positioning

is what you do to the mind of the prospect." To rise above the tumult in the environment, therefore, a company must find an open window in the mind of the prospect. The windows can be a better product, lower price, better after service or a company's reputation.

2.2.8 Ease of Implementation

> *"... the ease of implementing a segmentation solution significantly impacts on the success of normative segmentation."*
>
> *(Dibb & Simkin 1994: 57)*

Although the benefits of market segmentation have been widely discussed in the marketing literature, the results of many segmentation studies have not been actionable from a marketing standpoint (Young *et al.* 1978: 405). The ease of implementation refers to one of Kotler's (1994: 280-281) five market segmentation criteria, *actionability*. Numerous factors can thwart the actionability of a market segmentation study, such as a company's limited resources and time constraints (Segal & Giacobbe 1994: 39).

To overcome these problems, Segal and Giacobbe (1994: 41), in studying market segmentation in supermarket retailing, suggest that *compactness* and *interpretability* are the two criteria that contribute to actionability. The segments identified have to be compact, distinct and valid if the research is to have any managerial value. Also, the explanation for the segments has to be understandable by management (devoid of arcane terminology), otherwise the research will not be either believed or accepted. That is, as Lunn (1986: 423) argues, too much emphasis cannot be placed on the need to communicate the findings of segmentation with simplicity and clarity - however complex the data.

2.2.9 Coping with Market Dynamics

> *"The Hartford Insurance Group ... discovered that many of its customers in the fabricated metals industry were entering export markets. As a result, the insurer*

expanded its international coverage for these industries, thus growing its business by being responsive to changes in the marketplace."

(Wood & Ehrlich 1991: 59)

Clearly markets are changing all the time (Bell & Vincze 1988: 307). The changes may include shifts in buyer behaviour, the emergence of new buyer groups, and so on (Porter 1985: 271). The nature of the segments, hence, is not static, but is constantly changing as the markets themselves change (Beane & Ennis 1987: 38). Indeed, as Calantone and Sawyer (1978: 401-402) found, only about 29% of the consumers were in the same benefit segment as they had been two years previously. The fact that customers are very unlikely to remain in the same segment for long clearly illustrates the dynamic nature of markets.

If customers' choice behaviour varies with time then, as Speed and Smith (1992: 376) observe, a marketing programme aimed at that segment may be unsuitable. However, many companies fail to capture the underlying dynamics of a market. Such is the case of the Xerox company (Hlavacek & Ames 1986: 39). Xerox, the pioneer among photocopying machines, emphasised the high-speed segment for very large companies. Japanese competitors were the first to identify and develop a desktop plain paper copier for a business's low-speed needs. It soon became the fastest-growing copier market segment. Xerox failed to resegment the marketplace and allowed its Japanese competitors to take a large share of its business.

Therefore, coping with market dynamics is an important issue a company should not overlook. Wind and Cardozo (1974: 158) suggest that a marketer must review his segmentation strategy periodically. Through the re-segmentation procedure a company will be able to redirect its resources better to meet the customers' needs.

2.2.10 Creative Thinking

> *"One automobile dealer checked car radio preset buttons of vehicles brought in for service to assess customers' listening preferences. The company proceeded to buy advertising spots on the more popular stations."*
>
> *(Weinstein 1994: 231)*

Creativity plays an important role in segmentation research. According to Koontz and Weihrich (1988: 401), *creativity* refers to the ability and power to develop new ideas. Mcburnie and Clutterbuck (1988: 138-139) argue that imaginative segmentation can identify a host of viable new opportunities in an apparently mature market while unimaginative segmentation simply tends to average out critical differences between groups of customers.

For example, as Morrison and Lee (1979: 4) observe, the traditional approach to market segmentation is to segment markets according to certain market characteristics, most commonly customer needs. However, companies which are most successful in maintaining a competitive advantage over rivals may separate segments according to the strengths and weaknesses of different competitors. This enables the company to concentrate on segments where it can both maximise its own competitive advantage and avoid head-on competition with stronger competitors. In addition, Hamermesh *et al.* (1978: 98) suggest that, besides products and customers, a market can be segmented by level of customer service, stage of production, price performance characteristics, credit arrangements with customers, location of plants, characteristics of manufacturing equipment, channels of distribution, and financial policies.

Although segmentation studies can provide fresh perspectives on a situation, the means of translating findings into strategy is, in most cases, not clear, and perhaps the most difficult of all (Wind 1978b: 333). A marketer, hence, should look at the findings from various angles, adding business judgement, thinking and imagination into their marketing planning scenarios.

2.3 Measuring Success

This section reviews literature related to the major dependent variable of the research: segmentation success. The definition of success and the measurement of segmentation success are discussed.

2.3.1 Definition of Success

Success, according to The Concise Oxford Dictionary of Current English (Fowler & Fowler 1995: 1391), is "*the accomplishment of an aim; a favourable outcome.*" It is recognised that every organisation and every manager has more than one goal (Doyle 1994a). At an organisational level, the goals of a company may be profitability, market share, cost control and improvements in customer service. At a departmental level, a marketing manager may consider sales volume, advertising effectiveness, and cutting down employee absenteeism as possible goals. Whatever the objective, if a company or a department achieves its goal it could be considered as a success, at least in that specific aspect.

To determine if a favourable outcome has been accomplished, the goal must be measurable. Szilagyi suggests (1988: 134-135) there are two types of measurement most frequently presented. *Quantitative* measures are those to which some number can be assigned. Examples include net income, return on investment, market share, units produced, turnover and absenteeism rate, etc. These are also sometimes referred to as *objective* measures. *Qualitative* measures or *subjective* measures, such as personal comments, are used when managers simply cannot assign a quantitative figure to the achievement of a goal. Szilagyi (1988: 135) further asserts that quantitative measures are easily adaptable to lower-level jobs (e.g., number of units produced or sold). As for qualitative measures, they are often used to evaluate managerial performance and are much more difficult to measure.

2.3.2 Measuring Segmentation Success

> *"... As a result, the company experienced an increase in profits of more than 20 percent. Company officials attributed the increase almost wholly to the new market segmentation strategy."*
>
> *(Wind & Cardozo 1974: 160)*

According to Bonoma and Shapiro (1983: 1-2), the benefits of segmentation include market analysis, selection and marketing management. Presumably, *a successful segmentation* is a segmentation project, the results of which provide clear guidance for marketing action and hence lead to the company's better identification of customers, better allocation of resources, more satisfied customers, improved market shares, and an improved profit margin.

A review of existing literature shows that the measurement of segmentation success is still in an early stage of development. Many instruments are available in the literature for measuring all sorts of marketing functions (e.g., Bearden *et al.* 1993; Venkatraman & Ramanujam 1986; Webster 1990). Indeed, much literature is dedicated to finding ways towards more successful segmentation (e.g., Maier & Saunders 1990; Robertson & Barich 1992). In these studies, terms like *successful segmentation scheme*, *a highly effective segmentation approach*, or *successful implementation* are used to illustrate the theme of the research. Whatever the terms, however, most of this work has skilfully bypassed the issue of what the essence of segmentation success is. The example of Wind and Cardozo (1974: 160) quoted above is one of the most explicit indicators of segmentation success found in the market segmentation literature.

Failing to find a proper instrument for measuring segmentation success in the literature, the researcher turned to practitioners for help. In interviews with marketing managers, as expected, setting specific standards for measuring segmentation success proved to be a difficult task for the interviewees. Although many measures, such as sales volume, profit, and market share, were raised, none

received unanimous support from the practitioners. None of these measures is considered to be a reliable measure of segmentation success because too many extraneous factors exist. As Baker and Hart (1989: 85) argue, very little research has been carried out to evaluate the contribution of market segmentation and differentiated marketing (as opposed to mass selling) to competitive success. In addition, these measures encounter the same problems presented by Doyle (1994a: 8-9) in measuring business performance. The problems include the fact that each measure suffers from operational problems; each gives a limited perspective of segmentation; and each partly conflicts with the others. For example, there is no clear answer about how much profit increase can be attributed to segmentation success. There may be many factors other than segmentation success, such as the ups and downs of the macro-economic situation, which affect sales success.

As no instrument could be found in the literature and no consensus was reached in the interviews about the measurement of segmentation success, it was decided, with the consent of all the interviewees, to use a perceived and subjective measure. The uni-dimensional instrument for measuring segmentation success, of course, has its drawbacks. It may oversimplify the complexity of this concept and hence fail to catch the multifaceted nature of segmentation success. Nonetheless, this approach should not fundamentally affect the outcome of the study. As Dess and Robinson (1984: 271) conclude, managers' perception of how well their firm had performed - measured in a subjective and relative sense - was consistent with how the firm actually performed *vis-à-vis* return on assets and growth in sales. As for the precise measure of segmentation success, it will be left for further research.

2.4 The Critical Success Factor Approach

In this research, the theoretical background for relating the many factors identified in section 2.2 with segmentation success is the *critical success factor* (CSF) approach. In this section, the origin of the CSF approach and the reason for adopting it will be discussed.

2.4.1 Origin of the CSF Approach

> *"Critical success factors are, for any business, the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization. They are the few key areas where 'things must go right' for the business to flourish. If results in these areas are not adequate, the organization's efforts for the period will be less than desired."*
>
> *(Rockart: 1979: 85)*

Critical success factors, also known as key success factors - KSFs (Aaker 1988: 104; Grant 1991: 57), are those areas of the business that management must constantly monitor to ensure that the results are successful. This CSF concept was originated by Daniel (1961) and popularised in the information systems discipline by Rockart (1979) as a technique for eliciting the information requirements of managerial users.

By analysing a variety of companies and executives, Rockart found that relatively few elements determine whether a particular company or executive will be successful. CSFs are those key areas where high performance is necessary to achieve personal and company goals. By using a top-down approach to defining information needs, Rockart's objective was to enable the *management information system* (MIS) director to understand what is important to executive MIS users and then to develop the information systems to measure, control, and support CSF achievement.

2.4.2 Adoption of the CSF Approach

> *"Its* [CSF] *initial success in the domain of information systems has been overshadowed by the use of the technique as a mechanism to get managers to think through what are the critical dimensions of their jobs to which they must pay undivided attention."*
>
> *(Morton 1988: 61)*

The application of the CSF method has been so successful that it has gone far beyond the area of *management information system.* Over the years, the critical success factor approach has been widely adopted in different disciplines for identifying the most important elements of a firm's success. Ang *et al.* (1995) argue that identifying the CSFs involved in *manufacturing resource planning* (MRP) will assist firms in successfully implementing MRP and enable them further to improve their MRP systems to maximise returns. Easingwood and Storey (1991, 1993) use the CSF approach to identify the factors associated with the success of launching new financial services. Ferguson and Dickinson (1982) suggest boards of directors can use CSFs to establish guidelines for monitoring a corporation's activities. Munro and Wheeler (1980) argue that CSFs can be used to direct an organisation's efforts in developing strategic plans. In addition to applying CSFs to fabricate a set of strategies, they can also be used to identify critical issues associated with implementing a plan. Vasconcellos (1991) suggests that CSFs can be used to identify key areas in the marketing of mature products. Ward *et al.* (1990) use CSFs for evaluating and controlling marketing investment decisions.

For a segmentation project, many factors influence success. However, from the many examples quoted above, it is obvious that finding the way to achieve successful segmentation projects depends on identifying and explaining critical success factors for the company and dealing with them properly. Therefore, the CSF approach was adopted in this research for investigating the secrets of successful segmentation implementation.

2.5 Summary

The obvious first step in a research is a review of the literature. A literature study can provide a historical picture of what has been learned in a specific discipline and usually suggest a number of directions for further investigation.

This chapter begins with an overview of market segmentation. The independent variables of the research, factors believed to impact upon segmentation success, are discussed. The success factor list identified from the literature review may not be exhaustive so it will be expanded by pilot interviews with marketing practitioners to be discussed in section 4.3.2. The major dependent variable, segmentation success, is found to be a multidimensional concept that is difficult to measure. A subjective perceived success is then chosen to act as a surrogate measure of segmentation success.

From the review of market segmentation literature, it is found that although market segmentation has enjoyed central attention in the marketing field for a long time, little is known about the reasons why some segmentation projects are successful while others are not. Obviously, there is an urgent need to study the secrets of segmentation success. This research adopts a critical success factor approach to link the independent and dependent variables in the hope of uncovering these secrets.

3. Analytical Techniques

3.1 Hypothesis Testing Procedures
3.2 Underlying Assumptions
3.3 Univariate Statistics
3.4 Bivariate Statistics
3.5 Multivariate Statistics
3.6 Summary

This chapter describes the statistical techniques employed in the research for analysing the questionnaire data. To make the best use of statistical techniques, it is important to understand how the methods are applied; what questions they help to answer; when one method is more appropriate than another; and what inferences can be drawn from the results. By providing a review of the analytical techniques used in this research, these issues can be addressed.

There are six sections in this chapter. Section one is a brief review of the basic procedures for testing hypotheses. Section two discusses the importance of underlying assumptions for testing hypotheses. Sections three to five deal with the analytical techniques used in the research, including univariate, bivariate and multivariate statistics. Although these techniques can be used in different ways, and there are many issues related to their usage, only the topics which are relevant to this research are discussed. The last section is the chapter summary.

3.1 Hypothesis Testing Procedures

In conducting research, it is often necessary to employ inferential statistics so as to make decisions about the value of a parameter, such as a population mean or a population proportion. One of the most commonly used methods for making such decisions is a hypothesis test. Such tests have been used widely in exploring the relationships between independent and dependent variables in this study.

A hypothesis is an assumption made by a researcher about a population parameter (Levin 1984: 412). Typically, there are two kinds of hypotheses in a test. The *null hypothesis* (denoted as H_o) is a statement that no difference exists between the parameter and the statistic being compared to it. Any observed difference found, according to this hypothesis, is due to random sampling fluctuations only. A companion, the *alternative hypothesis* (denoted as H_a) is the logical opposite of the null hypothesis (Emory 1980: 407). The alternative hypothesis is the conclusion accepted when the data fail to support the null hypothesis (Weiss & Hassett 1991: 416). As the procedures for tests of most hypotheses are fairly standard, it is worthwhile giving a brief summary of the procedures as below. A more detailed discussion of hypothesis testing can be found in Hinton (1995: 33-43) and Morris (1989: 203-228).

- A hypothesis of no difference (null hypothesis) and its alternative are formulated.
- A test statistic, such as the *Student's t* test and ANOVA, is chosen to evaluate the null hypothesis.
- For the sample, the test statistic is calculated.
- If the null hypothesis is true, the probability of obtaining a test value at least as extreme as the one observed is determined.
- If the observed significance level is judged to be small enough, the null hypothesis is rejected and it is concluded that the alternative hypothesis is probably true. Otherwise, the null hypothesis is not rejected and the conclusion is that the data do not provide sufficient evidence to support the alternative hypothesis. In a *Student's t* test, for example, if the observed significance level is small (less than 0.05), the hypothesis that the two group means are equal is rejected.

In this research all of the hypotheses testing will follow the aforementioned procedures. As a general rule (Roscoe 1969: 155), the significance levels are set as 0.05 and 0.01.

3.2 Underlying Assumptions

To perform a statistical test of any hypothesis, it is necessary to make certain assumptions about the data. The assumptions depend on the particular statistical test being used. For example, *Student's t* test can be used to compare two sample means to see if the samples were obtained from normal populations with the same mean. To conduct this test, three assumptions are required. They are: the populations must be normally distributed (or approximately normally distributed); the populations must be independent; and the population variances must be equal (Mason & Lind 1993: 404).

For many tests, not all assumptions are equally important. While some tests require stricter assumptions, others are more flexible in this respect. Therefore, it is important for each test to consider what assumptions are needed and how severely their violation may influence results.

Fortunately, SPSS, the computer software package used in this analysis, includes many facilities for examining the violation of assumptions. These include the test of normality in exploring data, the equal variances Levene's test in the *Student's t* test, and *Bartlett's test of sphericity* in the factor analysis. In this research, a number of tests, such as the equal variances Levene's test in the *Student's t* test and *KMO* measure of sampling adequacy in the factor analysis, have been employed to detect violations of assumptions throughout the analysis.

3.3 Univariate Statistics

Univariate statistics refer to data analyses in which there is only one variable being studied (Walsh 1990: 14). That is, the analysis of one variable as opposed to the simultaneous analysis of two variables (bivariate) or more than two variables (multivariate). The *Student's t* test and analysis of variance (ANOVA) are the prime univariate statistics employed in this research.

3.3.1 *Student's t* Test

The *Student's t* test is used to test the hypothesis that two population means are equal. To do so, the following statistic is calculated (Kanji 1993: 29):

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

where $\overline{X}_1$ and $\overline{X}_2$ are the sample means of groups 1 and 2. S_1^2, S_2^2 are the variances, and N_1, N_2 are the sample size.

Based on the sampling distribution of the above statistic, it is possible to calculate the probability that a difference at least as large as the one observed will occur if the two population means (μ_1 and μ_2) are equal. This probability is called the *observed significance level.* If the observed significance level is small enough (usually less than 0.05 or 0.01), the hypothesis that the population means are equal is rejected.

Another statistic based on the *t* distribution, known as the polled-variance *Student's t* test, is based on the assumption that the population variances in the two groups are equal. It is obtained using a pooled estimate of the common variance. The statistic is the same as that in the previous equation except that the individual group variances are replaced by a pooled estimate, S_p^2. The statistic is (Kanji 1993: 28):

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{S_p^2}{N_1} + \frac{S_p^2}{N_2}}}$$

where S_p^2, the pooled variance, is a weighted average of the individual variances and is calculated as:

$$S_p^2 = \frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2}$$

To determine if the two population variances are equal, Levene's test (Norusis 1993: 255) can be used. This is obtained by computing, for each case, the absolute difference from its group mean and then performing a one-way analysis of variance on these differences. If the observed significance level for this test is small, the hypothesis that the population variances are equal is rejected and the separate-variance *Student's t* test for means should be used. Otherwise, the pooled-variance *Student's t* test should be used.

3.3.2 One-way Analysis of Variance (ANOVA)

ANOVA is an inferential procedure used to compare the means of several populations. ANOVA requires three assumptions: independent samples, normal populations and equal standard deviations. In one-way ANOVA, the null hypothesis is that all population means are equal:

$$H_0: \mu_1 = \mu_2 = \cdots = \mu_n$$

H_a: *Not all the means are equal*

To test the hypothesis, *first*, the variation amongst the sample means is measured by a weighted average of their squared deviations from the mean, $\bar{x}$, of all the sample data. That measure of variation is called the *treatment mean square*, *MSTR*, and is defined as (Weiss & Hassett 1991: 707):

$$MSTR = \frac{SSTR}{k - 1}$$

where k denotes the number of populations being sampled and

$$SSTR = n_1(\bar{x}_1 - \bar{x})^2 + n_2(\bar{x}_2 - \bar{x})^2 + \cdots + n_k(\bar{x}_k - \bar{x})^2$$

The quantity *SSTR* is called the *treatment sum of squares.*

Secondly, to decide whether *MSTR* is large enough to conclude that the null hypothesis of the equal population means is false, *MSTR* is compared with the pooled estimate of the common population variance, σ^2 within the samples. This is called the *error mean square*, *MSE*, and is defined as:

$$MSE = \frac{SSE}{n-k}$$

where k denotes the number of populations under consideration, n denotes the total number of pieces of sample data, and

$$SSE = (n_1 - 1)s_1^2 + (n_2 - 1)s_2^2 + \cdots + (n_k - 1)s_k^2$$

The quantity of *SSE* is called the *error sum of squares.*

As *MSE* is an estimate of the common variance of the populations under consideration, if *MSTR* is large relative to *MSE*, then it can be inferred that the variation amongst the sample means is due to a difference amongst the population means and not to the variation within the populations. Thus, the following statistic can be calculated:

$$F = \frac{MSTR}{MSE}$$

Large values of F indicate that *MSTR* is large relative to *MSE* and, hence, that the null hypothesis of equal population means should be rejected.

To summarise the procedures of ANOVA analysis, a general format of a one-way ANOVA table is shown in Table 3-1.

Table 3-1 One -way ANOVA Table

Source	df	SS	MS = SS/df	*F*-statistic
Treatment	k - 1	$SSTR$	$MSTR = \frac{SSTR}{k-1}$	$F = \frac{MSTR}{MSE}$
Error	n - k	SSE	$MSE = \frac{SSE}{n-k}$	
Total	n - 1	SST		

3.4 Bivariate Statistics

Bivariate statistics refers to the analysis of two variables when the purpose is to study the relationship between the variables. The main bivariate statistics used in the research are Pearson correlation coefficient (Healey 1993: 380-409) and the *Chi-square* test (Walsh 1990: 165-187).

3.4.1 Pearson Correlation Coefficient

Correlation analysis is a widely used method for determining whether there is a linear relationship between two variables. One commonly adopted correlation measure, the Pearson correlation coefficient, denoted by r, is defined as (Norusis 1993: 292):

$$r = \frac{\sum_{i=1}^{N}(X_i - \overline{X})(Y_i - \overline{Y})}{(N-1)S_X S_Y}$$

where N is the number of cases and S_X and S_Y are the standard deviations of the two variables. The absolute value of r indicates the strength of the linear relationship between the variables X and Y. The correlation coefficient, r has the following properties (Lindeman *et al.* 1980: 38):

- The value of r is zero when there is no linear relationship between X and Y.

- The possible values of r range from -1.00 to +1.00. The values r = -1.00 and r = +1.00 occur when there is a perfect linear relationship between X and Y.
- Because r^2 is a ratio of a sum of squares to its maximum value, it may be interpreted as the proportion of the total Y variance accounted for, or "explained," by the linear relationship between X and Y.

To test whether the population correlation coefficient ρ is 0, the following equation can be used (Walsh 1990: 253),

$$t = r\sqrt{\frac{N-2}{1-r^2}}$$

which, if $\rho = 0$, has a *Student's t* distribution with N - 2 degrees of freedom.

An assumption for using the linear correlation coefficient is that the data points are actually scattered about a straight line and correlation analysis should be employed as a descriptive measure only when a scatter diagram indicates that this is the case (Weiss & Hassett 1991: 625). Another common mistake in interpreting the correlation coefficient is to assume that correlation implies causation (Norusis 1993: 294). This interpretation is not always true. It may be that Y and X are strongly correlated because they are both associated with a third variable. Under these circumstances, X alone does not necessarily result in the increase or decrease of Y.

3.4.2 *Chi-square* Test

The hypothesis that two variables from a cross-tabulation are independent of each other is often of interest to researchers. Two variables are called statistically independent (or non-associated) if within the categories of one of the variables, the distribution of the other variables is the same (Weiss & Hassett 1991: 554).

The *Chi-square statistic* is often used to test the hypothesis that the row and column variables are independent. According to Weiss and Hassett (1991: 563),

there are two assumptions associated with the use of the *Chi-square* test: all expected frequencies are at least one, and no more than 20% of the expected frequencies are less than five. If one or both of these assumptions is violated, there are three ways to deal with it. Rows or columns could be combined to increase the expected frequencies in those cells where they are too small; certain rows and columns where the small expected frequencies occur could be eliminated; or, the sample could be increased.

Pearson *Chi-square* is calculated by summing for all cells the squared residuals divided by the expected frequencies (Walsh 1990: 168):

$$\chi^2 = \sum_i \sum_j \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where O_{ij} is the observed frequency in cell ij and E_{ij} is the expected frequency in cell ij, and is calculated as:

$$E_{ij} = \frac{(count\ in\ row\ i)\ (count\ in\ column\ j)}{N}$$

As the value of the *Chi-square* depends on the number of rows and columns in the table being examined, the degrees of freedom, which can be viewed as the number of cells of a table that can be arbitrarily filled when the row and column totals are fixed, must be known. For an $r \times c$ table, the degrees of freedom are $(r - 1) \times (c - 1)$. The calculated χ^2 is compared to the critical points of the theoretical *Chi-square* distribution to produce an estimate of how likely (or unlikely) this calculated value is if the two variables are in fact independent. If the observed significance level of the test is small enough (usually less then 0.05 or 0.01), the hypothesis that the two variables are independent is rejected (Healey 1993: 258-260).

3.5 Multivariate Statistics

Multivariate statistics is a general term used to describe a group of mathematical and statistical methods the purpose of which is to analyse multiple measures of *N* individuals (Kerlinger 1986: 524). The particular phenomena which a researcher wishes to study and explain may be complex. There may be many variables which influence such phenomena, and multivariate methods are ways of studying multiple influences of several independent variables on one or more dependent variables. In measuring many variables, multivariate techniques enable a researcher to perform a single analysis instead of a series of univariate or bivariate analyses (Tabachnick & Fidell 1989: 2). There are all kinds of multiple techniques including: multiple regression, canonical correlation, factor analysis, cluster analysis, discriminant analysis, conjoint analysis, and so on. In this section, only those analyses that are relevant to the research are discussed. These include: factor analysis, cluster analysis and discriminant analysis.

3.5.1 Factor Analysis

Factor analysis is a multivariate statistical technique that is concerned with defining new factor variates as linear transformations of the original correlated variables (Overall & Klett 1972: 89-90). Its use is appropriate when studying interrelationships among variables in an effort to find a new set of variables, fewer in number than the original variables, which express that which is common among the original variable (Stewart 1981: 51).

There are three situations where factor analysis can be used (Gorsuch 1974: 3-4). *First*, through factor analysis, the number of variables for further research can be minimised while also maximising the amount of information in the analysis. The original set of variables is reduced to a much smaller set which accounts for most of the reliable variance of the initial variable pool. The smaller set of variables can be used as operational representatives of the constructs underlying the complete set of variables. *Secondly*, factor analysis can be used to

search data for possible qualitative and quantitative distinctions, and is particularly useful when the sheer amount of available data exceeds comprehensibility. This kind of exploratory work can be used to find new constructs and hypotheses for future theory and research. *Thirdly*, if a domain of data can be hypothesised to have certain qualitative and quantitative distinctions, then this hypothesis can be tested by factor analysis. If the hypotheses are tenable, the various factors will represent the theoretically derived qualitative distinctions. If one variable is hypothesised to be more related to one factor than another, this quantitative distinction can also be checked.

Factor analysis usually proceeds in four steps: (1) examining the correlation matrix for all variables; (2) determining the number of factors necessary to represent the data and the method for calculating them; (3) rotating and transforming the factors to make them more interpretable; and (4) computing the score of each factor for each case (Norusis 1994: 50). These issues will be discussed in detail. Moreover, several issues need special attention when using factor analysis. They include decisions on: the cutting point of factor loading, the determination of factor number, and the naming of factors. They will also be dealt with in the following sections.

3.5.1.1 Examining the Correlation Matrix

The first step in factor analysis involves the creation of a correlation matrix (Walsh 1990: 331). Factor analysis is concerned with the homogeneity of variables. A pattern of low correlations indicates a heterogeneous set of variables. If the correlations between variables are small, it is unlikely that they share common factors, and factoring may be inappropriate (Stewart 1981: 57). To test the hypothesis that the correlation matrix of all the variables is an *identity matrix*, that is, all diagonal terms are 1 and all off-diagonal terms are 0, *Bartlett's test of sphericity* can be used. The hypothesis tested is that the correlation matrix came

from a population of variables that are independent. Rejection of the hypothesis is an indication that the data are appropriate for factor analysis.

Another way to test the appropriateness of applying factor analysis is through the *Kaiser-Meyer-Olkin* Measure of Sampling Adequacy (known as *KMO* or *MSA*). *KMO* is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. It is computed as (Stewart 1981: 57):

$$KMO = \frac{\sum\sum_{j \neq k} r_{jk}^2}{\sum\sum_{j \neq k} r_{jk}^2 + \sum\sum_{j \neq k} q_{jk}^2}$$

where r_{jk} is the simple correlation coefficient between variables j and k, and q_{jk} is the partial correlation coefficient between variables j and k. If the sum of the squared partial correlation coefficients between all pairs of variables is small when compared to the sum of the squared correlation coefficients, the *KMO* measure is close to 1. Small values for the *KMO* measure mean the simple correlation coefficient between variables is small and the partial correlation coefficient is large which means correlations between pairs of variables cannot be explained by the other variables. As a result, a factor analysis of the variables may not be a good idea.

To test the appropriateness of applying factor analysis, Kaiser (1974: 35) proposes the following index for reference:

Table 3-2 Interpretation of *KMO* Index

KMO Index	Suitability for Factor Analysis
in the 0.90s	marvellous
in the 0.80s	meritorious
in the 0.70s	middling
in the 0.60s	mediocre
in the 0.50s	miserable
below 0.50	unacceptable

Before further exploration of the questionnaire data in this research, the *KMO* index was checked. The value was 0.78, which is closed to the "meritorious" level. Therefore, factor analysis could be comfortably applied.

3.5.1.2 Extracting Factors

After checking *Bartlett's test of sphericity* and the *KMO* measure, the next step is the extraction of factors. There are several methods which can be adopted for extracting factors, such as principal component, common factor, principal-axis factoring and unweighted least-squares (Child 1990: 30; Tabachnick & Fidell 1989: 623). Of these, principal component analysis and common factor analysis are the most widely used. In this research principal component analysis has been chosen instead of common factor analysis for several reasons (Lindeman *et al.* 1980: 262):

- It usually produces results that do not differ markedly from those of common factor analysis.
- It avoids the necessity of estimating communalities and selecting one of a number of methods of varying theoretical and practical validity for estimating them.
- It allows factor scores to be computed directly, rather than requiring that they be estimated.
- An effective theoretically and empirically based method is available for determining the number of common factors.

Principal component analysis seeks to describe a set of associated variables in terms of a set of mutually uncorrelated linear combinations of the same variables. The linear combinations are chosen in such a way that the first set of variables accounts for as much of the total variance of the original data as possible. The second factor accounts for the next largest amount of variance and is uncorrelated with the first. Successive factors explain progressively smaller

portions of the total sample variance, and all are uncorrelated with one another. This process goes on, until no more factors can be extracted (Crawford & Lomas 1980: 416).

As a general rule of thumb, the final set of factors together should account for at least 60% of the total variance of all measures (Suen & Ary 1989: 186). This is because if the factors together account for only a small portion of the variance, these factors cannot be considered useful substitutes for the original measures. In this research, the first factor extracted explained 31.7% of the total variance, with 9.2%, 7.0% and 6.3% for the three successive factors. In total, the ten extracted factors in this research accounted for 76.7% of the variance, so they can be regarded as legitimate substitutes of the original 31 variables.

To identify factors, it is necessary to group the variables that have large factor loadings for the same factors. *Factor loadings* are the correlation coefficients which indicate the strength of the association between each of the variables and the derived factors (Walsh 1990: 331). The grouping of the variables can be done by sorting the pattern matrix so that variables with high factor loadings on the same factor appear together. If, in any case, the factor loadings are negative, all this means is that the computer has "read the angles" between the test vectors and the factor vectors with the latter at 180^{o} from the usual direction. Therefore, it is perfectly acceptable to reverse *all* of the signs in any one factor if necessary (Child 1990: 36). In this research, while ten factors were extracted, three were found to have negative factor loadings. To get clearer results from the following statistical analysis, these three factors were multiplied by *-1* so that all the ten factors had positive factor loadings.

One important issue in using factor analysis is deciding which factor loadings are worth considering when it comes to interpreting the factors. As a rule of thumb, loadings having values of $\pm$ 0.3 or greater can be taken as significant, if the sample size is greater than 100 (Child 1990: 39). Hair *et al.* (1987: 239) propose following more accurate criteria: factor loadings greater than 0.3 are

considered significant; those greater than 0.4 are considered more important; and if the loadings are 0.5 or above, they are considered very significant. The larger the absolute size of the factor loading, the more significant the loading is in interpreting the factor matrix. In this study, 0.5 is used as the lower limit of factor loading.

Another important issue concerns the determination of the factor number. If the number is too large, some of the residual or error factors will be mixed in with the common factors, and if it is too small, important common factors will be omitted. Several criteria have been suggested to decide the number of factors to be extracted. The most commonly used rule is the *eigenvalue one criterion*, in which only the factors with an eigenvalue greater than 1 are extracted (Jobson 1992: 394). However, this method is not without criticism. When large numbers of variables are involved (e.g. > 40), the criterion seems particularly inaccurate (Stewart 1981: 58; Tabachnick & Fidell 1989: 635).

A popular alternative approach to the determination of the number of factors is the *Cattell's scree test* (Child 1990: 38). This method employs a graph of the eigenvalues (vertical) versus the factor number (horizontal) as seen in Figure 3-1. Since the eigenvalues are ordered from largest to smallest, the typical shape of a scree plot consists of two parts: a rapidly downward sloping first part with an exponential shape followed by a second part which is almost a horizontal line. The almost horizontal part is viewed as random variation. This part is referred to as the *scree*, since it resembles a scree of rock debris at the foot of a mountain. The correct number of factors corresponds to the eigenvalue number to the immediate left of the beginning of the scree called the *elbow* (Jobson 1992: 395). In Figure 3-1, for example, the scree begins at the fifth component; therefore four factors should be used.

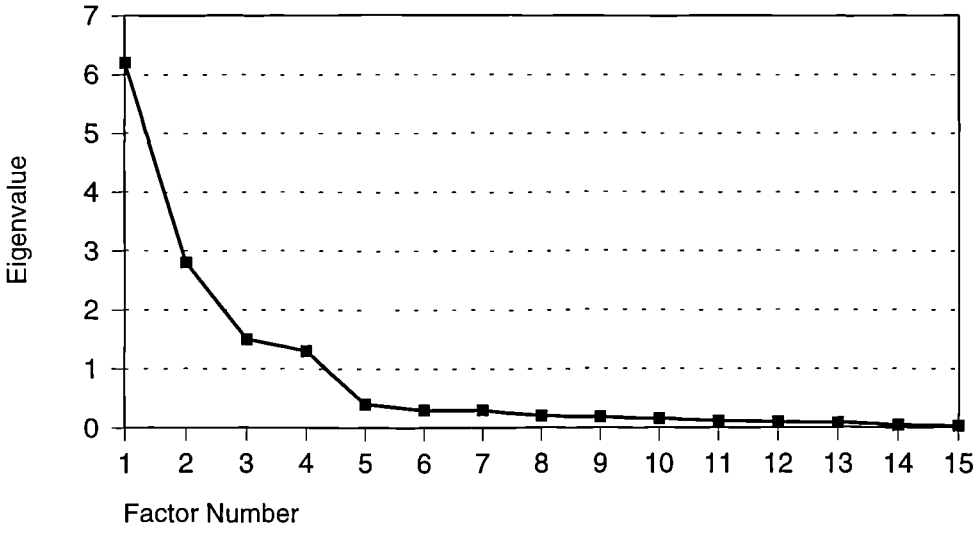

Figure 3-1 Factor Scree Plot

The use of the eigenvalue one criterion and the scree test appear to provide effective means for determining the number of factors. However, these two criteria do not always agree (Jobson 1992: 395). For example, Hackett and Foxall (1994: 169-171 & 176) identified a solution of 11 factors with eigenvalues greater than one and yet the scree plot information resulted in only three factors being extracted. Therefore, some judgements are still needed on the appropriate number of factors. Stewart (1981: 59) concludes that over-factoring by one or two factors has less severe consequences for the final solution than does taking too few factors. Cattell (1952) recommends the extraction of an extra factor or two on the grounds that the extra factors become residual factors upon rotation and their presence improves the interpretation of the results.

Originally in this research nine factors were extracted, based on the eigenvalue one criterion. However, it was found that lowering the eigenvalue to 0.9 and extracting one more factor greatly improved the interpretation of the results. Thus, ten factors in total were extracted in this research.

3.5.1.3 Rotating Factors

The methods of extracting factors described so far are sometimes referred to as *direct* methods because the factor matrix obtained arises directly from the correlation matrix by the application of specified mathematical models. Most factor analysts are now agreed that some direct solutions are not adequate (e.g., Child 1990: 44; Stewart 1981: 59). In most cases, adjustment to the frames of reference of the direct method improves the interpretation of the results. The process of manipulating the reference axes is known as *rotation.* According to Everitt and Dunn (1991: 253), this is a procedure which allows new axes to be chosen so that the positions of the points can be described as simply as possible. The results of rotation methods are sometimes referred to as *derived* solutions because they are obtained as a second stage from the results of *direct* solutions (Child 1990: 44).

Stewart (1981: 59) encourages the use of rotation techniques, especially oblique rotations, as they have been found particularly useful in the theory building of other disciplines, and are likely to play a significant role in the development of any theory of consumer behaviour. For this reason, oblique rotation was chosen for the analysis in this research.

A number of objective mathematical procedures have been developed for oblique rotation. However, according to Hakstian and Abell (1974: 444), no single computing procedure yields uniformly optimal oblique solutions for all kinds of data. The method for oblique rotation available in the SPSS factor analysis procedure is called *oblimin* (Norusis 1994: 71). The selection of this method for the research, hence, was based primarily on availability and does not imply that it is the "best" method available.

Another major task in using factor analysis is the naming of factors. At some point, a researcher usually tries to characterise a factor by assigning it a name or a label. However, variables do not always form linear composites which

lend themselves to easy, or even logical, description. Thus, a researcher may sometimes find it difficult to attempt naming the factors extracted (Crawford & Lomas 1980: 420). In this research, the researcher was fortunate as the naming of the ten factors did not present particular difficulties.

3.5.1.4 Computing Factor Scores

Since the main goal of factor analysis is to reduce a large number of variables to a smaller number of factors, it is often desirable to estimate factor scores. *Factor scores*, according to Overall and Klett (1972: 89), are composite variables that represent the status of individuals on factor dimensions and they are defined as weighted combinations of several original variables. Most of the differences between individuals that were originally represented in terms of numerous correlated measurements can be represented in terms of the smaller number of factor scores. The factor scores can then be used in subsequent analyses to represent the values of the factors. As principal component analysis was used in the research, the exact score for the *j*th factor of case *k*, $\hat{F}_{jk}$, is calculated as:

$$\hat{F}_{jk} = \sum_{i=1}^{p} W_{ji} X_{jk}$$

where X_{jk} is the standardised value of the *i*th variable for case *k* and W_{ji} is the factor score coefficient for the *j*th factor and the *i*th variable (Norusis 1994: 73).

A factor may be considered as a variable that is indirectly rather than directly measured. Hence, the obtained factor scores may be analysed in the same ways as direct measurements, using, for example, *Student's t* tests or ANOVA. This is a procedure frequently employed to reduce a large number of related variables to a factor measurement for further analysis. Lindeman *et al.* (1980: 282-283) claim such measures are often superior to direct measures due to increased reliability. This is because factor scores are weighted linear composites

of positively correlated measures that best define the factor. Reliability increases with length because the true component of a score is proportional to the number of equivalent elements that contribute to it. It follows, then, that factor scores representing composites tend to be more reliable than variable scores (Lorr 1983: 14).

In this study, 31 independent variables were reduced to 10 factors. This data reduction made it easier to analyse and interpret the relationships between the independent variables (the segmentation activities) and the dependent variable (segmentation success).

3.5.2 Cluster Analysis

Cluster analysis refers to a wide variety of techniques used to group entities into homogeneous subgroups on the basis of their similarities. Other names given to the process are numerical taxonomy, pattern analysis, and typing (Lorr 1983: 1)

In many instances, a researcher uses a single variable to identify a group or a category to which a respondent belongs. However, when respondents are compared on independent attribute dimensions, respondents similar on one dimension need not be similar on other dimensions. That is, there is no single way to categorise people or other entities. People who are alike with respect to one set of attributes are not necessarily more alike on other attributes than people in general. People may be alike in political attitude but very different in food preference, body type, and personality style. Thus the notion of similarity has meaning only with respect to a specified set of attributes (Lorr 1983: 12-13).

Cluster analysis identifies different groups (or clusters) of respondents in such a way that the respondents in any one cluster are similar to one another but different from the respondents in the other clusters. Cluster analysis procedures search through the data and identify respondents who have given identical, or at least similar, answers to a certain combination of questions which are chosen as

cluster variables before the analysis starts. These respondents are clustered together. The cluster analysis procedures then search through the data, looking for a second set of respondents, all of whom have given similar answers to the same combination of questions. This second set of respondents are all similar to one another, but they are also quite different from the respondents in the first cluster. By proceeding in this manner, cluster analysis procedures may identify a third cluster of respondents who are different from the first two clusters. The procedures can be continued until all of the different clusters have been identified.

Generally speaking, cluster analysis proceeds in five steps: selecting cluster variables, measuring distances, combining clusters, determining cluster numbers and validating cluster results.

3.5.2.1 Selecting Cluster Variables

The first step in a cluster analysis is the selecting of variables which will serve as the basis for cluster formation. According to Mercer (1992: 89) the selection of meaningful variables is vital for cluster analysis. If important variables are excluded, poor or misleading findings may result. The initial choice of variables determines the characteristics that can be used to identify subgroups.

In this research, the ten factors identified in the previous factor analysis were divided into three groups. These groups related to the plan, fieldwork and action stages associated with the segmentation projects reviewed. Factors in each stage were then used as entry variables for successive cluster analysis (see section 6.2.1).

3.5.2.2 Measuring Distances

The second step in cluster analysis is to determine the method for measuring the distance between two cases. That is, measuring the closeness or similarity of two cases.

There are three types of measures available - interval, frequency count, and binary. Measures for interval data include Euclidean distance, Pearson correlation, and so on. For frequency count data, *Chi-square* and Phi-square measures can be used. As for binary data, squared Euclidean distance, size difference, pattern difference, and so forth can be used (Norusis 1994: 104-107). A more detailed discussion about distance measures can be found in Lorr (1983: 22-44).

As an interval scale was used in this research, Euclidean distance measure was chosen for measuring distances between the cases. Euclidean distance is the square root of the sum of the squared differences over all of the variables, and is denoted as (Afifi & Clark 1984: 387):

$$\text{Distance } (X, Y) = \sqrt{\sum_i (X_i - Y_i)^2}$$

The smaller the distance measure, the more alike are the cases. There are two main reasons for using this approach. *First*, it is easy to understand and *secondly*, it allows the measurement of distance in any number of dimensions (Saunders 1980: 424).

3.5.2.3 Combining Clusters

The commonly used methods of combining clusters fall into two general categories: non-hierarchical and hierarchical (Afifi & Clark 1990: 440). The *non-hierarchical* procedures are of two kinds. The *first* technique involves iterative partitioning of entities into multiple clusters. After the initial assignment, some optimising criterion is applied to relocate entities into clusters. The *second* technique is to form clusters one at a time and without iteration for a better assignment (Lorr 1983: 20). For example, *K-means* clustering is a popular non-hierarchical clustering technique. For a specified number of clusters *K*, the basic algorithm proceeds in the following steps (Afifi & Clark 1984: 394-395). *First*,

divide the data into *K* initial clusters. The members of these clusters may be specified by the user or may be selected by the programme, according to an arbitrary procedure. *Secondly*, calculate the means or centroids of each of the *K* clusters. *Thirdly*, for a given case, calculate its distance to each centroid. If the case is closest to the centroid of its own cluster, leave it in that cluster; otherwise, reassign it to the cluster whose centroid is closest to it. *Fourthly*, repeat step 3 for each case. *Lastly*, repeat steps 2, 3, and 4 until no cases are reassigned.

Hierarchical methods can be either agglomerative or divisive. The *agglomerative* technique begins with all *N* individual cases or units and at each stage combines the two entities or clusters that are closest; finally all cases are combined into one family or cluster. The *divisive* technique operates in the opposite direction. It begins with the entire set and subdivides it into two and continues to subdivide each cluster into finer subsets. (Lorr 1983: 20).

The procedures for combining clusters can be illustrated with a tree diagram called a *dendrogram*, like the one shown in Figure 3-2. The dendrogram identifies the clusters being combined and the values of the distances at each step. The dendrogram produced by SPSS does not plot actual distances but rescales them into numbers between 0 and 25. Thus, the ratio of the distances between steps is preserved, but the scale displayed at the top of the figure does not correspond to actual distance values (Norusis 1994: 91-93).

In Figure 3-2, vertical lines denote joined clusters. The horizontal axis, which is rescaled to fall in the range of 0 to 25, indicates the distance at which the clusters were joined. Though the sequence in which some of the early clusters are formed cannot be seen from the dendrogram, as many of the distances early on are similar in magnitude, at the last two stages they are fairly large and can easily be identified. Looking at the dendrogram, it appears that the extraction of two clusters may be appropriate, because it occurs before the distance at which clusters are combined became too large.

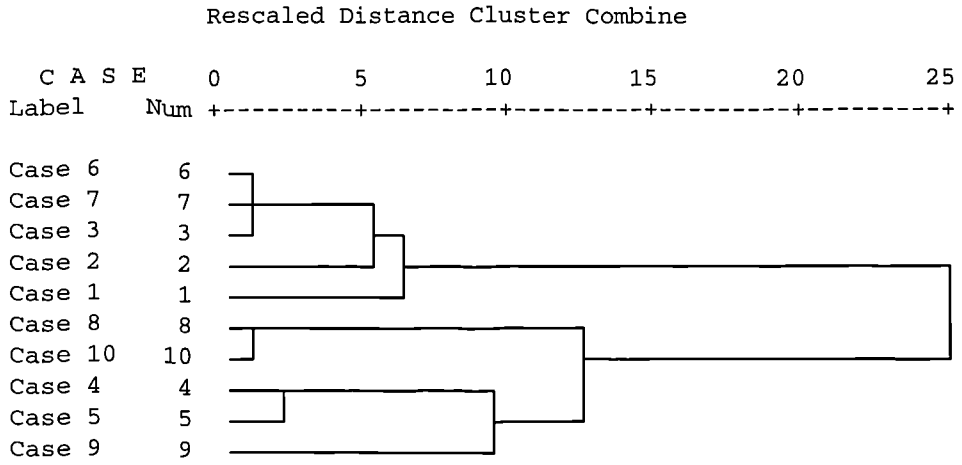

Figure 3-2 Dendrogram

To decide which cases of clusters should be combined at each step, several methods can be used. All of these methods are based on a matrix of either distances or similarities between pairs of cases, but differ in how they estimate distances between clusters at successive steps. In general, the methods fall into three types: *linkage* method, *variance* method, and *centroid* method (Norusis 1994: 97). These will each be briefly discussed.

The *linkage* method includes single linkage, complete linkage and average linkage (Lorr 1983: 62-68). In *single linkage*, the distance between two clusters is taken to be the distance between their two closest points. In *complete linkage*, the distance is measured between their two furthest points. As for *average linkage*, the distance is defined as the average of the distances between all pairs of cases in which one member of the pair is from each of the clusters.

The *variance* method is based on the premise that the most accurate information is available when each entity constitutes a group. Consequently, as the number of clusters is systematically reduced from *n*, *n-1*, *n-2*, ..., *2*, *1*, the grouping of increasingly dissimilar entities yields less precise information. The criterion which reflects the levels of desirability of the various partitions or groupings is called the *objective function* (Duran & Odell 1974: 2). Each

reduction in groups is achieved by considering all possible pairings and selecting the pairing for which the *objective function* is the smallest (Lorr 1983: 90).

Ward's approach is a frequently used *variance* method for combining clusters. For each cluster, the means for all variables are calculated. Then, for each case, the squared Euclidean distance to the cluster means is calculated. These distances are summed for all of the cases. At each step, the two clusters that merge are those that result in the smallest increase in the overall sum of the squared within-cluster distances.

As for the *centroid* method, the distance between clusters is defined as the distance between the cluster centroids (Lorr 1983: 89). The first stage of the procedure consists of fusing the two individuals who are closest to form a group. At each stage individuals (or groups) which are closest are merged to form a new group. The last stage consists of the fusion of the two remaining groups into a single group (Everitt 1974: 12-14).

As Afifi and Clark (1990: 447) suggest, cluster analysis is an empirical technique. It may be advisable to try several approaches in a given situation. Punj and Stewart (1983: 141-143) provide a comprehensive review of the applications of clustering methodology to marketing problems and use both theoretical and empirical findings to suggest which clustering methods may be most suitable for a specific research. The rationale for evaluating clustering methods involves comparing the results of different clustering methods applied to the same data sets. If the underlying characteristics of these data sets are known, the degree to which each clustering method produces results consistent with these known characteristics can be assessed. For example, if a data set consists of a known mixture of groups, or subpopulations, the efficacy of a cluster solution can be evaluated by its success in discriminating among these subpopulations. The results of Punj and Stewart (1983: 138) show that Ward's method is one of those which outperform most other methods. Therefore, Ward's method was used in this study.

3.5.2.4 Determining Cluster Numbers

A major problem of cluster analysis is the choice of the number of clusters. As Boyd *et al.* (1989: 629) illustrate, if four different clusters are formed, it is difficult for the researcher to know if four is the proper number of clusters, or whether there should really be three, five or some other number. Unfortunately, there are no standard objective criteria for the determination of cluster numbers. However, the distances between clusters at successive steps may serve as a guide (Afifi & Clark 1990: 444). Perhaps the most common is to examine the dendrogram for large changes between adjacent fusion levels (see Figure 3-2 in section 3.5.2.3). A large change in the dendrogram level is indicative of the appropriate number of clusters (Everitt & Dunn 1991: 110; Seber 1984: 388). For example, a big change in going from, say, n to $n - 1$ clusters in a dendrogram might be indicative of a n clusters solution.

In this research the dendrogram was used to decide the cluster number in each of the three cluster analyses performed. Each of the three dendrograms showed a sudden jump from two clusters to one (see Figures 6-1 to 6-3). Therefore, two clusters were chosen for each of the analyses. These clusters were labelled *weakly-oriented* and *strongly-oriented* respectively. A more detailed discussion of the cluster results can be found in section 6.2.

3.5.2.5 Validating Cluster Results

> *"An inherent problem in the use of a clustering algorithm in practice is the difficulty of validating the resulting data partition. This is a particularly serious issue since virtually any clustering algorithm will produce partitions for any data set, even random noise data which contains no cluster structure. Thus, an applied researcher is often left in a quandary as to whether the obtained clustering of a real life data set actually represents significant cluster structure or an arbitrary partition of random data."*
>
> *(Milligan 1981: 187)*

As Milligan claims, one characteristic of cluster analysis is its ability to form homogeneous groups even from random data. Punj and Stewart (1983: 145) also contend that even after careful analysis of a data set and the determination of a final cluster solution, the researcher has no assurance of arriving at a meaningful and useful set of clusters. Therefore, it is important to validate the clustering results once the solution has been obtained.

Several methods have been suggested for validating cluster results. *First*, Green *et al.* (1988:594) suggest significance tests could be performed on variables used to create clusters. *Secondly*, Everitt (1974: 66) suggests that the data could be randomly divided into halves and each half clustered independently. This is known as the split-half test. Membership assignment in the partitioned samples should be similar to that in the entire sample, if the clusters are stable. *Thirdly*, an alternative and popular method is to perform discriminant analysis in which discriminant functions are used to predict group membership to check the adequacy of classification for cases in the same sample through cross-validation (Tabachnick & Fidell 1989: 508).

All of the aforementioned methods, significance tests, split-half and discriminant analysis, were used in this research for validating the cluster results. They all produced very encouraging results (see section 6.2.2), indicating that the data gathered in this research are very clearly structured (Everitt 1974: 66).

3.5.3 Discriminant Analysis

Discriminant analysis, according to Lawson (1980: 387), is a technique to discover the characteristics that distinguish the members of one group from another, so that given a set of characteristics for a new individual, the group to which he should be assigned can be predicted. In this research, discriminant analysis was applied to the 86 fully completed cases to see if group membership generated by cluster analysis could be predicted. As discriminant analysis was used as a means for validating the results of cluster analysis (Tabachnick & Fidell

1989: 508), the review of this technique will be brief. A full discussion of discriminant analysis can be found in Eisenbeis and Avery (1972) and Cacoullos 1973).

3.5.3.1 Selecting Discriminant Variables

For any given classification problem there are many variables that can be used to classify the data. It is therefore necessary to choose a smaller subset of the variables which leads to good classification results. There are several reasons for doing so (Hand 1981: 120-121). *First*, it is expensive and time consuming to gather data, so the fewer the variables the better. If an adequate subset of the original measurements can be found then only this subset need be measured. *Secondly*, it is possible that a small set of variables may produce a simpler and clearer picture of the data structure. *Thirdly*, by choosing a smaller set it is possible to eliminate redundancy. There is no point in measuring a variable which does not add to the accuracy of the classification achieved without this variable. *Finally*, a lower misclassification rate can sometimes be achieved by using fewer variables. In this research, variables related to the *plan*, *fieldwork* and *action* stages (see section 6.2 for detail) were used respectively as classification variables in the discriminant analysis for validating the cluster results.

3.5.3.2 Calculating Discriminant Scores

In discriminant analysis, a linear combination of the independent variables is formed and serves as the basis for assigning cases to groups. By finding a weighted average of variables, a score is obtained for each case and used for assigning to different groups. The linear discriminant equation is denoted as:

$$D = B_0 + B_1X_1 + B_2X_2 + \cdots + B_pX_p$$

where Xs are the values of the independent variables and the Bs are coefficients estimated from the data. If a linear discriminant function is to distinguish between

two groups, the two groups must differ in their D values. Therefore, the Bs are chosen so that the values of the discriminant function differ as much as possible between the groups, or so that the discriminant scores, the ratio

$$\frac{between\text{–}groups\ sum\ of\ squares}{within\text{–}groups\ sum\ of\ squares}$$

is a maximum. Any other linear combination of the variables will have a smaller ratio. (Norusis 1994: 7)

3.5.3.3 Classifying Cases into Groups

Using the discriminant score, cases are then assigned into different groups based on the following Bayes' rule.

$$P(G_i|D) = \frac{P(D|G_i)P(G_i)}{\sum_{i=1}^{g} P(D|G_i)P(G_i)}$$

where $P(G_i)$, the *prior probability*, is an estimate of the likelihood that a case belongs to a particular group when no information about it is available. $P(D|G_i)$ is the *conditional probability* of D given that the group membership is known. $P(G_i|D)$ is called *posterior probability* and can be estimated from $P(D|G_i)$ and $P(G_i)$, using Bayes' rule. A case is classified, based on its discriminant score D, into the group for which the posterior probability is the largest.

3.5.3.4 Classifying Output

To compare the group membership generated from discriminant analysis with the cluster results, a *confusion matrix* can be used. A confusion matrix (Table 3-3) shows the numbers of correct and incorrect classifications. Correctly classified cases appear on the diagonal of the table as the predicted and actual groups are the same. For example, of the $n_{11}+ n_{12}$ in group 1, n_{11} were predicted correctly to be members of group 1, while n_{12} were assigned incorrectly to group

2. Similarly, n_{22} out of $n_{21}+ n_{22}$ of the group 2 cases were identified correctly, and n_{21} were misclassified. The overall percentage of cases classified correctly is: $\frac{(n_{11}+n_{22})}{(n_{11}+n_{12}+n_{21}+n_{22})}$. In this research, the correct classification rates of the three clusters were 95.4%, 90.7% and 98.8% (see section 6.2.2).

Table 3-3 Confusion Matrix

Actual Group (from cluster analysis)	Number of Cases	Predicted Group (from discriminant analysis)	
		1	2
1	$n_{11}+ n_{12}$	n_{11}	n_{12}
2	$n_{21}+ n_{22}$	n_{21}	n_{22}

3.6 Summary

This chapter has reviewed the statistical techniques employed in the research for analysing the questionnaire data. The purpose of reviewing these techniques was three fold. *First*, statistics provides scientific procedures for gathering, organising, summarising and analysing quantitative research data. There are all sorts of techniques for analysing data, yet not all are suitable for the purpose of this research. Hence, it is important to identify those which will be used in the research. *Secondly*, statistics permits the summarisation and presentation of a large amount of research information in such a way as to facilitate its communication and interpretation. A review of the techniques helps show how they can be utilised to do the job properly. *Thirdly*, statistics enables the researcher to extend his research far beyond the restricted setting in which most research is actually conducted. Of course, this extension is not without limitations. However, following rigorous statistical procedures, a researcher can draw inferences and generalisations from small groups to larger groups with a well-defined degree of confidence.

In this chapter, hypothesis testing procedures were reviewed. The importance of underlying assumptions for statistical techniques was explored.

Three types of statistics, univariate, bivariate and multivariate statistics, were introduced. The univariate and bivariate statistics include: *Student's t* test, one-way analysis of variance, correlation coefficient and *Chi-square* test. The analysis of the research data relies much on multivariate statistics, including factor analysis, cluster analysis and discriminant analysis, and so these three techniques were reviewed in some detail. The actual analysis of data using these techniques is presented in Chapters Five and Six.

4. Research Design

4.1 Research Approaches
4.2 Variables in the Research
4.3 Collecting Qualitative Data
4.4 Collecting Quantitative Data
4.5 Reliability and Validity
4.6 Sampling Design
4.7 Research Biases
4.8 Data Preparation and Analysis
4.9 Validating Interviews
4.10 Summary

This chapter describes the methodology and procedures employed in the research. Table 4-1 outlines the research design of this study. There are ten sections in this chapter, including research approaches, variables in the research, collecting qualitative and quantitative data, reliability and validity, sampling design, research biases, data preparation and analysis, and validating interviews. The last section is the chapter summary.

As shown in Table 4-1, the research proceeded in three phases over a period of three and a half years. *First*, a qualitative approach, including a literature review and pilot interviews, was employed. The time span of this phase covered late 1992 to late 1993. The purpose of this phase was to acquire basic knowledge about the research topic, to understand the research domain, and to uncover hidden dimensions related to segmentation success that might have been overlooked in the marketing literature. *Secondly*, a quantitative approach, including the development of a questionnaire, a large-scale fieldwork survey and statistical analysis of the data, was conducted. This phase began in early 1994 and ended in early 1995. *Lastly*, a qualitative approach, including interviews with several marketing managers previously contacted during the first phase of the research, was conducted from early 1995 to mid 1995. The intention of this phase

was to validate the research findings and to assist in the interpretation of the results.

Table 4-1 Outline of the Research Design

Steps	Methodology	Sections
Phase I: Qualitative Research		
1. Identification of factors which may impact on the success of segmentation	• Review of the literature • Pilot interviews	• 2.2 • 4.3.2
Phase II: Quantitative Research		
2. Development of the questionnaire to be sent to marketers to collect relevant data	• Review of the literature • Consulting academics and marketing managers • Pretesting, modification, and fine-tuning of the questionnaire	• 2.2 - 2.4 • 4.3 • 4.4 - 4.5
3. Rating of segmentation projects on the proposed factors	• Questionnaires completed by marketing managers	• 4.6
4. Simplification and consolidation of the factors	• Correlation analysis • Factor analysis	• 5.2.6 • 5.2.6
5. Identification of successful/ unsuccessful segmentation projects	• Assessment based on marketing managers' subjective judgements	• 6.1
6. Association of factors with segmentation success	• Calculation of average scores • Test of significance	• 6.1 • 6.1
7. Assigning cases to different groups	• Cluster analysis • Discriminant analysis	• 6.2 • 6.2
8. Investigating characteristics of different case groups	• Test of significance	• 6.2.3
Phase III: Qualitative Research		
9. Justification of the results	• Validating interviews	• 4.9
10.Conclusion, managerial implications, critiques, and recommendations for segmentation implementation	• Crystallisation and interpretation of the analysis results • Thinking and writing up	• 5 - 7 • 1 - 7

4.1 Research Approaches

> *"The human reality must be apprehended by a variety of viewpoints, not by one alone, because this very reality is always in part a construct, always in part an image, and only by encouraging difference in perspective and approach can one obtain the needed richness of imagery, and consequently, theory."*
>
> *(Bennett & Thaiss 1967: 307)*

This research began with focusing and refocusing the research question. At this early stage, the methods of investigation to be used were not really a main issue. The requirement was to adopt a flexible approach by using those methods that were appropriate for the research questions posed. Accordingly, an approach combining *qualitative* and *quantitative* methods, known as *triangulation* (Burgess 1993: 104), was adopted in this research.

A *qualitative* study, as Creswell (1994: 1-2) notes, is an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting. A *quantitative* study is an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers, and analysed with statistical procedures, in order to determine whether the predictive generalisations of the theory hold true. *Triangulation* is the combination of qualitative and quantitative methodologies in the study of the same phenomenon (Denzin 1978: 291).

Triangulation is a term borrowed from navigation and military strategy. Its basic idea is to use multiple reference points to locate an object's exact position (Smith 1975: 273). Given basic principles of geometry, multiple viewpoints allow for greater accuracy. Similarly, information gathered from different methods can improve the accuracy of a research. Creswell (1994: 175) gives five reasons for combining methods in a single study. These include: *triangulation*, in the classic sense of seeking convergence of results; *complement*, in that overlapping and

different facets of a phenomenon may emerge; *development*, wherein the first method is used sequentially to help inform the second method; *initiation*, wherein contradictions and fresh perspectives emerge; and *expansion*, wherein the mixed methods add scope and breadth to a study.

There are four barriers to the adoption of the *triangulation* approach (Warwick 1983: 294-296). These are *limited competence*, the sheer lack of capacity to draw on methods other than the one in which the researcher was originally trained; *disciplinary ethnocentrism*, the tendency of the various social science disciplines or sub-disciplines to exalt the virtues of their dominant methods and disparage those of other fields; *costs*, the costs are often high; and *opportunities*, the lack of suitable projects for combining methods.

In this research, the researcher, after painstaking efforts, managed to overcome these obstacles and adopted the integrated approach. During the first year of his PhD programme, from late 1992 to mid 1993, the researcher took courses related to qualitative and quantitative methodology. These courses allowed the researcher to review the different methods commonly used in management studies and triggered the quest for a better understanding of the use of these methods. Later, these courses proved to be helpful as both qualitative and quantitative approaches are needed in the researcher's focusing the research topic, gathering and analysing the empirical data as well as validating the research results. As for the cost concern, the researcher was granted a two-year bursary from the Warwick Business School which greatly reduced the financial burden of conducting the research.

4.2 Variables in the Research

A variable, according to Kerlinger (1986: 27), is a symbol to which numerals or values are assigned. In general, there are three types of variable involved in research. *First*, there is the *independent variable* whose effect upon some other variables the research is designed to measure. The *second* type of

variable relates to the outcome of the research and is known as the *dependent variable.* In many instances independent variables are considered as either predictor or causal variables because they predict or cause the dependent variables. However, independent variables and dependent variables are defined within a research context; a dependent variable in one research setting may often be an independent variable in another.

The *last* type of variable consists of those other than the manipulated independent variables that could influence the outcome (i.e., dependent variable) of the research. They are known as *extraneous variables.* According to Stern (1979: 63), an extraneous variable is a variable capable of explaining the findings of a study without invoking the hypothesis. In other words, the presence of an extraneous variable allows for "alternative explanations" of a set of observations: either the observed relationships are due to the variables in the hypothesis, or they result at least in part from an extraneous variable. Often extraneous variables are demographic items (Creswell 1994: 63). If not controlled adequately, extraneous variables can be the source of errors in research (Green *et al.* 1988: 202-203). The following example adapted from Rosenberg (1968: 264-265) clearly shows how the existence of extraneous variables can distort the interpretation of research findings.

Assume a researcher begins with the finding that older people are more likely than younger people to listen to religious programmes on the radio (see Table 4-2). In considering why this may be so, he suggests that perhaps this is due to the factor of *education.* That is, were older people better educated, they would be less likely to listen to religious programmes.

Table 4-2 Age and Listening to Religious Programmes

Listen to religious programmes	Young listeners	Old listeners
Yes (%)	17	26
No (%)	83	74
Total percent	100	100

The task, now, is to eliminate the influence of education. This can be done by comparing younger and older people of *equal education*. Thus, the researcher compares the listening habits of *poorly-educated* and *well-educated* young and old people. Table 4-3 shows the results. It can be seen that amongst the poorly-educated, older people are hardly more likely than the young to listen to religious programmes, and the same is true amongst well-educated people. Thus, were it not for education, there would be almost no relationship between age and listening. These data thus point to the following conclusion: older people are more likely to listen to religious programmes and one factor may be that older people are generally more poorly educated and poorly-educated people are more likely to listen to religious programmes.

Table 4-3 Age and Listening to Religious Programmes (by education)

Listen to religious programmes	Poor education		Good education	
	Young	Old	Young	Old
Yes (%)	29	32	9	11
No (%)	71	68	91	89
Total percent	100	100	100	100

Based upon the hypotheses developed in Chapter Two, the *independent variables* in the research design are those factors that contribute to the success of the segmentation projects studied. These variables are termed "success factors" in the research (see section 2.2 for discussion). The *dependent variables* are the "success" of the segmentation projects investigated (see section 2.3 for discussion). All of the demographic variables are treated as *extraneous variables*. The possible intervention of the demographic variables in the hypotheses testing will be investigated in section 6.4.3.

4.3 Collecting Qualitative Data

Phase one of the research started with a review of the literature to gain the foundation knowledge required for the research. Later, several interviews were

conducted to acquire deeper understanding of the research topic. This qualitative phase uncovered many factors that are critical to segmentation success and was important in the consecutive development of the research instrument.

4.3.1 Desk Research

> *"... students who undertake to build a systematic theory of marketing will find stones at hand for the purpose. The stones must be dug out of the existing literature, reshaped, and supplemented by many others that remain to be discovered. They nevertheless provide material for a start."*
>
> *(Alderson & Cox 1948: 148)*

The starting point for the research was a review of the literature to find out what academicians and practitioners regard as important to the success of segmentation. A number of factors affecting segmentation success can be found in the literature and have been discussed in Chapter Two.

After the initial list of success factors was generated from the review of the literature, four marketing professionals were asked to review the list and add factors which they considered to be important to segmentation success. The expanded list of factors was then used as the basis for the following pilot interviews.

4.3.2 Pilot Interviews

> *"Seldom is more than a fraction of the existing knowledge in any field put into writing."*
>
> *(Emory 1980: 89)*

While the literature review has revealed many CSFs for segmentation, the researcher was wary that some additional components might have been overlooked. If the following questionnaire survey were based solely on evidence from literature, the research would run the risk of missing some important

elements. In consideration of this fact, meeting practitioners to understand general segmentation practice and to establish what they perceive as important to segmentation success was considered to be essential to the research. Also, discussions with marketing managers regarding their experiences in segmentation was useful in developing hypotheses that would be meaningful from the practitioners' viewpoint.

To help the interview process, an open-ended questionnaire (see Appendix 1) was compiled as a checklist. The questionnaire covered questions like company background, segmentation planning and implementation issues. The preparation of the checklist served a number of functions (Hague & Jackson 1987: 87-94).

- It helped ensure that the interview ran smoothly.
- It made the interview more interesting for the respondent.
- It ensured that the researcher was disciplined to ask all the necessary questions and to do so in the correct manner.
- It acted as an aide-memoir.
- It facilitated the recording of data.

Twelve interviewees, chosen from businesses units in Milton Keynes, Bedfordshire, were contacted (see Appendix 2). The reasons for conducting these interviews were twofold: *first*, to gain an understanding of how practitioners perceive and adopt segmentation in their marketing strategy; and *secondly*, to consider the factors they think are important for implementing segmentation. These interviews, each of which lasted between forty minutes and one hour, allowed the researcher to meet industrial experts and to generate ideas for the research. As this was an early stage of the research, the scale of interviewing was small and no attempt was made to select a representative sample. The sampling location was chosen mainly for the convenience of the researcher. In addition, Milton Keynes is a newly developed town, with many businesses in the area.

During the interviews, managers were asked to discuss the strengths, weaknesses, and problems of their company, in relation to market segmentation. Also, they were encouraged to speak freely about their personal views on market segmentation. Several other success factors, such as *the clear objectives of the segmentation project, the need for qualified personnel in the project team, problems of budget constraints,* and *company capability*, emerged from the interviews and were subsequently taken into consideration in the development of the questionnaire. In addition, much valuable feedback was achieved which led to significant modification of the checklist. Furthermore, the researcher gradually learned to ask more meaningful and fluent questions.

At the end of the interview the researcher closed the discussion and thanked the respondent. In addition, the researcher asked to be able to contact the respondent again, should more information be required. This left the door open for coming back for clarification whenever necessary. A thank-you letter (see Appendix 3) was sent to the respondents a few days after the interview to show appreciation and to ensure that the researcher would be cordially received at some future date.

4.4 Collecting Quantitative Data

Phase two of the research involved using a questionnaire to collect quantitative data. Based on knowledge drawn from the literature review and experience gained from the interviews, a considerable amount of time was dedicated to the development of the questionnaire. The questionnaire served as the tool for gathering larger scale data needed to test the research hypotheses.

4.4.1 Questionnaire Design

The researcher could not find from the literature an existing instrument available for the purpose of the study. Therefore, a self-designed questionnaire was required. As Hague (1993: 11-12) noted, the purposes of questionnaires are:

to draw accurate information from the respondent; to provide a structure to the interview so that it flows smoothly and in orderly fashion; to provide a standard format on which facts, comments and attitudes can be recorded; and to facilitate data processing. For a questionnaire to be successful, it must take the respondent through the answering process in such a way that he or she finds it easy to give accurate answers to the questions. Therefore, in addition to thinking about what is wanted from the questionnaire survey, special attention has been given to see the questions from the viewpoint of the respondent.

In the questionnaire (see Appendix 4), the top part of the front page comprised the name of the Warwick Business School, the School logo, the name of the research "1994 Segmentation Survey", as well as the *Strictly Confidential!* statement. These pieces of information were given to show the identity and legitimacy of the institution carrying out the research. Underneath was a short explanation of the objectives of the survey, and also included were instructions regarding the completion of the questionnaire and operational definitions of some related terms.

The main body of the questionnaire consisted of three parts. The first, *general information* (Q.1-12), contained questions about company demographic data, such as company size, turnover, and ownership. It was recognised that the classification of these demographic questions should be based on the information from business directories so that they could be used to make comparisons with the industry as a whole. However, as the sampling design of the research covered several industries (see section 4.6), there was no such demographic information available about these industries as a whole. Therefore, the classification of each question was based on the results and comments from the pre-test. For example, in question 2, relating to number of employees, originally there were six categories (20 or fewer, 21-49, 50-99, 100-499, 500 or more, and don't know). During the pre-test, it was found that a wider scale was needed, so the "1,000 or more" was added.

In many surveys, demographic questions are left to the last part of the questionnaire. However, in this survey, the researcher felt they were the easiest to answer. According to Tull and Hawkins (1990: 314), the first questions should be easy to answer, so it was considered helpful to put them in the first part so that the respondents would feel comfortable and be able to tune into the more complex questions as they went along.

The second part, *segmentation in general* (Q.13-18), covered questions about people's perceptions of segmentation: its objectives, its usefulness and its degree of acceptance in the industry. Although the purposes of segmentation are well documented, there is a general lack of empirical evidence about the priority of its objectives. Also, little evidence is available about its acceptance in the industrial setting. The purpose of the second part was to uncover these issues. Furthermore, these questions were considered to be closely related to the next section (part three) of the survey. In this respect they provided a useful warm-up exercise to gear the respondents to answering the questions in part three.

The third part, *a specific segmentation project* (Q.19-34), asked respondents about their company's, as well as their own, experience of involvement in a segmentation project. If respondents felt they were not in a position to answer these questions, they were free to skip, after having answered question 20, to question 34, at the end of the questionnaire. All respondents who felt that they had information about, or experience of, a specific segmentation project were asked to give their opinions about that specific project.

As discussed in Chapter Two, this research identified from the literature several success factors relating to segmentation implementation. Some of the success factors, like *well designed planning* and *top management support* (see section 2.2), were generic to other management functions. To make the factors more specific to a segmentation project, it was decided to break those success factors down to actual segmentation activities, that is, to their daily operation levels. The break down resulted in the 31 statements in question 26. In this

question the participants were asked to rate the extent to which they agreed or disagreed with the proposed statements about the specific segmentation project being studied. Also, they were asked to give their estimation of the perceived success of the segmentation project. Positive relationships between the proposed success factors and perceived segmentation success were then hypothesised and tested to see if the relationships were significant.

Some open-ended questions (e.g., questions 27, 30 and 33) were also included in this part of the questionnaire. Owing to the exploratory nature of the research, these open-ended questions were used to give respondents the chance to comment on any issue that might have been overlooked by the research.

After the first version of the questionnaire was developed, apart from the pre-test to check its reliability and validity, a great deal of attention was given to the construction and layout. The main point here was to minimise the possibility of recording mistakes. In addition, special care was given to the physical flow of the questions, so that respondents could easily move from one question to the next. Furthermore, for the purpose of optical data scanning, the questionnaire was sent to the Warwick Computing Service to check that the layout met the requirements for computerised data scan. This procedure later cut out the need for extensive data verification, and enabled data to be transcribed onto the computer more quickly and accurately.

4.4.2 "Don't Know" and "No Answer"

The questionnaire survey used five-point Likert scales to measure the many aspects of participants' attitudes towards segmentation in general and towards a specific segmentation project. The individual's responses to the various scales were then examined, or summed, to provide attitude scores for the individual.

Likert scales require a respondent to indicate a degree of agreement or disagreement with each of a series of statements in the questionnaire. When

undertaking a questionnaire survey, it is unrealistic to assume that all respondents will answer all of the questions. A question may be irrelevant. The respondent may not know the answer, or may not be in a position to answer the question. Therefore, a question will frequently elicit "don't know" or "no answer" responses. A procedure is needed to ensure that these responses are properly coded and handled.

Boyd *et al.* (1989: 485) suggest three ways of handling the "don't know" problem.

- Show the "don't know" as a separate category. This is the best procedure, for it does not mislead the reader about what has happened.
- Estimate answers from other data contained in the questionnaire. Occasionally the "don't know" answer can be inferred by studying other information contained in the questionnaire.
- Distribute the "don't knows" proportionately amongst the other categories. This procedure assumes that the remainder of the sample will be representative of the universe. This assumption may not be correct, and, therefore, if the extent of the "don't knows" is not shown, the reader may be misled.

In this research, the first alternative was chosen to deal with the issue. Hence, "don't know" was treated as a separate category in all questions.

4.4.3 Pre-test

A pre-test to enhance the reliability and validity of the research was conducted before the final delivery of the questionnaire. The objective of the pre-test was to check whether respondents would have any difficulty in answering the questions. The pre-test also checked the comprehensiveness of the questionnaire. The sample for the pre-test included six marketing faculty members and five PhD

students at the University of Warwick, and five marketing managers previously contacted during the pilot interview stage.

Questionnaires were first handed to the participants for them to look at and to fill in. They were encouraged to include any remark or suggestion deemed necessary. Also, they were asked to evaluate the instrument for leading questions, clarity, relevancy, biases and ambiguity, anything which might render parts of the questionnaire ineffective. A few days later, one-to-one meetings were arranged with each participant to go through any items of concern. The meetings lasted in most cases between thirty minutes and one hour.

The pre-test showed that some changes were necessary. Some questions had to be rephrased to ensure clear communication. Some questions which contained terminology and language that were not clearly understood were revised or deleted. The participants later checked and approved the revisions.

4.4.4 Response Rate

A question that concerns survey researchers highly is the response rate. Jobber and Bleasdale (1987: 9) summarise previous research and find a falling trend of response rate from 37% in 1966 to 24% in 1985. This considerable decrease in response rate poses a big challenge to the researcher. It would be very annoying if the response rate were not adequate for this research. Therefore, many techniques were used to stimulate the response rate. These included giving clear instructions for answering the questions, maintaining respondent anonymity, offering respondents a report of the study results, and providing stamped envelopes.

In spite of these actions to boost the response rate, there may still be many obstacles which reduce the rate. As London and Dommeyer (1990: 235) report: industrial respondents are likely to have gatekeepers (e.g., secretaries) who may lose the questionnaire before the potential respondent is able to see it; people who

receive questionnaires at the workplace may be too preoccupied with their business tasks to answer a survey; some industrial managers may be reluctant to reply to a survey for fear of divulging proprietary information; and some companies may have policies that prohibit or limit employees' participation in surveys (see, for example, Appendix 5). Therefore, to ensure a high response rate demands more than a well-designed questionnaire.

In this research, a personal delivery approach was adopted. This idea originated from an earlier visit to the trade show *Retail Solutions '92* at Olympia, London in October 1992. Several of the traders were contacted and asked about their willingness to participate in a survey. Almost all showed agreement and said they would return the questionnaire, if asked to do so.

Balancing the falling trends in response rate illustrated by Jobber and Bleasdale (1987: 9) and the encouraging feedback from the trade show visit was complicated. However, the research that Jobber and Bleasdale reviewed was conducted solely on mailed questionnaires. The researcher therefore suspected that, if the questionnaire were delivered personally, the response rate might at least sustain the 1985 level of 24% responses. Later, this estimation was used as the basis for deciding the number of questionnaires to be delivered.

When the questionnaires were delivered at the NEC, participants were approached according to the sampling frame (see section 4.6.3). The researcher gave a short self-introduction and a brief explanation of the purpose of the study. The contents of the questionnaire were also explained. If the people contacted were not suitable for participating in the research, they were asked to introduce one of their colleagues who might be in a better position to fill in the questionnaire. Copies of the questionnaire and self addressed envelopes were then left for them to complete and send back. Each respondent was also asked to leave name and address at the end of the questionnaire if he/she was interested in receiving a report of the research findings.

This way of delivering questionnaires enabled the researcher to reduce the many obstacles reported by London and Dommeyer (1990: 235). Also, it created an opportunity for the researcher and the respondents to interact. Later, from the 40.5% (243/600) response rate, the researcher was convinced that personal contacts, together with the techniques above, did significantly help to increase the response rate.

4.5 Reliability and Validity

> *"If one does not know the reliability and validity of one's data little faith can be put in the results obtained and the conclusions drawn from the results."*
>
> *(Kerlinger 1973: 442)*

The process of developing the questionnaire involved other aspects beyond the appearance, wording and layout. Of particular concern were the reliability and validity of the research. As stated by Kerlinger, it is of vital importance to consider reliability and validity issues so as to ensure the quality of the research.

4.5.1 Reliability

According to Carmines and Zeller (1994: 3), *reliability* concerns the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials. Kerlinger (1973: 443) suggests that reliability be epitomised by the question: *If we measure the same set of objects again and again with the same or comparable measuring instrument, will we get the same or similar result?* He (1973: 454) further proposes some general guidelines to improve the reliability of a research instrument. They include: writing the items of the measuring instruments unambiguously; adding more items of equal kind and quality, if an instrument is not reliable enough; and providing clear and standard instructions for answering the questions.

In accordance with Kerlinger's guidance, pre-tests (see section 4.4.3) were conducted prior to the actual questionnaire delivery to ensure the reliability of the research instrument. The pre-tests greatly helped the fine-tuning of the questionnaire so that the questions were easy to answer and the logic easy to follow. Furthermore, a small scale test-retest experiment, suggested by Reaves (1992: 80), was conducted to assess the reliability of the research instrument. After the final version of the questionnaire was ready, two practitioners who had participated in the pre-test stage of the research two months earlier were asked to fill in the questionnaire again. The answers were checked with their previous answers, and it was found that the two versions were similar. For practical reasons, it was difficult for the researcher to conduct a large scale test-retest experiment. However, the results, though qualitative in nature established the reliability measurement for the study.

4.5.2 Validity

> *"... suppose an educational scientist wishes to study ... the relation between authoritarianism and teaching style. ... there are no rulers to use, no scales with which to weigh the degree of authoritarianism, no clear-cut physical or behavioral attributes that point unmistakably to teaching style. It is necessary in such cases to invent indirect means to measure psychological and educational properties. These means are often so indirect that the validity of the measurement and its products is doubtful."*
>
> *(Kerlinger 1973: 456)*

As discussed in the previous section, reliability is important for a research instrument. However, it is not enough for a test method to be reliable; it must also be valid. To illustrate this point, Carmines and Zeller (1994: 5) give a good example: "let us assume that a particular yardstick does not equal 36 inches; instead, the yardstick is 40 inches long. Thus, every time this yardstick is used to determine the height of a person (or object), it systematically underestimates height by 4 inches for every 36 inches. A person who is six feet tall according to

this yardstick, for example, is actually six feet eight inches in height. This particular yardstick, in short, provides an invalid indication of height. Note, however, that this error of 4 inches per yard will not affect the reliability of the yardstick since it does not lead to inconsistent results on repeated measurement.. On the contrary, the results will be quite consistent although they will obviously be incorrect. In short, this particular yardstick will provide a quite reliable but totally invalid indication of height."

Hence, considerable efforts were made to ensure the validity of the research instrument. According to Green *et al.* (1988: 250), three different types of validity are generally used in testing the validity of an instrument. These are content validity, criterion validity and construct validity.

4.5.2.1 Content Validity

Content validity is concerned with how representative an instrument is of the universe of the content of the property or characteristic being measured (Green *et al.* 1988: 250). This type of validity implies that all aspects of the attribute being measured are considered by the instrument. An instrument can be said to possess content validity if there is general agreement amongst the experts in the field that the constituent items cover all aspects of the variable being measured.

To ensure high validity, the measuring instrument of the research was developed based on a comprehensive review of the literature, industrial experience obtained from pilot interviews with practitioners, and detailed evaluations by six academicians and five marketing managers. Although this judgement of content validity remains a subjective one, the research instrument can be said to have high content validity.

4.5.2.2 Criterion Validity

Criterion validity (sometimes referred to as concurrent validity, external validity or predictive validity), Nunnally (1967: 76) notes, "is at issue when the purpose is to use an instrument to estimate some important form of behavior, the latter being referred to as the *criterion*." He illustrates the concept with an example of a test employed to select college freshmen. The test, whatever it is like, is useful in that situation only if it accurately estimates successful performance in college. The criterion in this case probably would be grade-point average obtained over four years of college. After the criterion is obtained, the validity of a prediction function is straightforwardly, and rather easily, determined. Nunnally (1967: 76) suggests that criterion validity, primarily, consists of correlating scores on the predictor test with scores on the criterion variable. The size of the correlation is a direct indication of the amount of validity.

In this research, criterion validity of the success factors measures would be demonstrated if the scores on the measures highly and positively correlate with segmentation success. An examination showed that, of the ten success factor measures, six significantly correlated with segmentation success. They are factors 1 to 5, the most important factors in the instrument, and factor 9. The four non significant factors (factors 6, 7, 8 and 10) are the least important ones in the measure. These results should be a good indicator of the high criterion validity of the research instrument.

4.5.2.3 Construct Validity

Construct validity is concerned not only with the question "Does it work?" but also with the development of criteria that permit answering theoretical questions about why it works and what deductions can be made concerning the theory underlying the instrument (Green *et al.* 1988: 251). As Tull and Hawkins (1990: 276) point out, this is the most complex form of validity - to understand the factors that underlie the obtained measurement.

So, construct validity in the current research involves knowing how well the success factor measure works; it also involves knowing why the measure works. To check the construct validity of the research instrument, factor analysis can be used. This is an approach widely used by researchers (e.g., Allison 1978; Churchill *et al.* 1974; Noerager 1979). The *KMO* index and the Bartlett's test of sphericity of factor analysis can be calculated to explore the possible construct underneath the success factor instrument. The resultant *KMO* index (0.78) and the significance of Bartlett's test ($P < 0.001$) suggest that there is a clear construct embedded in the instrument design. In addition, the ***PFA*** model (see section 6.4), which is developed based on the success factor instrument, can be used to explain why some projects are successful while others are not, indicating the high construct validity of the research instrument.

4.6 Sampling Design

> *"In chemistry or in physics there is often no problem of finding* ***le cas pur*** [the pure case]. *When the chemist wants to establish a proposition about sulphur he can use any lump of chemically pure sulphur (provided its crystalline form is irrelevant to the experiment) and treat it as a true and pure representative of sulphur. If a social scientist wants to study The Norwegian Voter, it would simplify research enormously if he could find the pure voter, the one person who would be the representative of all Norwegian voters, so that all that was necessary would be to ask him or watch his behaviour. At present, the belief in the possibility of finding* ***le cas pur****, on the individual or collective level of analysis, seems to have disappeared completely from social research."*
>
> *(Galtung 1967: 16)*

The current research design involves the examination of data collected from a sample drawn from a larger population. The researcher, of course, did not conduct the research just to describe the sample alone. The research intention is to make assertions about the larger population from which the sample has been selected. That is, the researcher wants to interpret sample findings as forming the

base for inferences about the larger population. In drawing the inference, special care must be taken so that the sample will sufficiently represent the total population.

4.6.1 A Sampling Approach

> *"The U. S. Census Bureau has long emphasized that its ten-year population census is in many ways less accurate than its ongoing sample research, if only because the population census involves the use of large numbers of relatively inexperienced interviewers."*
>
> *(Smith 1991: 135)*

Sampling, according to Smith (1991: 134), can be defined as "a procedure by which we infer the characteristics of some group of objects (a population) through experience with less than all possible elements of that group of objects (a sample)." In contrast to sampling, a *census* is obtained by collecting information about each member of a group. Together the members of such a group are called a *population* (de Vaus 1993: 60).

In practice, there are several advantages in using the sampling approach rather than the census (Smith 1991: 134). Sampling usually permits the researcher to cut costs, reduce work-force requirements, gather information more quickly, and obtain more comprehensive data. Owing to constraints of time and budget, the choice of a sampling approach was obvious for this research. Thus, a carefully designed sampling process was used to collect a sufficient sample size for data analysis.

4.6.2 Defining Population

Given the advantages of sampling, good sampling is still not feasible without some clear conceptions of what the researcher is sampling. Sjoberg and Nett (1968: 130 & 144) suggest a clear construction of three notions known as the "general universe," "working universe," and "sample." The *general universe* is

the abstract universe to which the researcher assumes, however tentatively, that his findings will apply. The *working universe* is that specific, concrete system from which one selects his units of study, notably his respondents. Such a system is often referred to by statisticians as a "population." Lastly, the *sample* is the units selected by the researcher from the working universe.

As the main objective of the research is to explore the implementation of segmentation projects across different industries, the *general universe*, hence, includes all industries. The *working universe* (population) in this research were the eight trade shows picked up from the NEC (*National Exhibition Centre, Birmingham*) exhibitions. These eight trade shows include: AIHS (Autumn Ideal Home Show), IWEX (International Water and Effluent Treatment Exhibition), Rooftec (Roofing Technology), ASFI (Association of Suppliers to the Furniture Industry), WOODMEX (International Exhibition of Woodworking & Sawmill Machinery & Equipment), Software Development, Tooling and Manufacturing Week. The *samples* were then selected randomly from the eight trade shows.

There were several reasons for choosing the eight trade shows from the NEC. *First,* companies within an industry are usually more alike than companies from different industries. Such similarities create problems while trying to generalise the research findings to different industries. Therefore, it is preferable to choose as many different industries as possible. Owing to the time constraint, it was impossible to include in this research all of the trade shows at the NEC. The timing of the eight shows selected fitted well into the schedule of the research so they were chosen as the population of the research. *Secondly*, the NEC trade shows are well known to most UK industries, and to enterprises on the Continent as well. Each year the NEC attracts hundreds of thousands of companies from different industries. It offers a great opportunity for the researcher to get access to as many companies as possible in a very short time period. *Thirdly*, earlier visits to the NEC exhibitions (CEMEX '94: Circuit Equipment Exhibition; Healthcare; Hospital & Care Premises Management; and TIME: The Incentive Marketing

Exhibition) and conversations with business people showed that most exhibitors were co-operative and willing to participate in the survey. This encouraged the researcher to choose the NEC as an ideal place for delivering questionnaires. *Fourthly*, the shows at the NEC gave the researcher the chance to deliver personally all of the six hundred questionnaires. This enabled the researcher to explain briefly the purpose of the research to the people contacted and to encourage them to participate in the survey. This interaction, later, was considered to have great helped the relatively high response rate of the research. *Finally*, the NEC was convenient for the researcher. The NEC is located to the east of the city of Birmingham, not far from the University of Warwick. Taking into consideration all the reasons above, the eight trade shows were considered to be suitable for the research.

4.6.3 Selecting A Sample

Having discussed the notions of the *general universe*, *working universe* and *sample*, the question now moves on to the selection of samples that reflect the complexities of the particular working universe the researcher is investigating. As Roscoe (1969: 133-134) notes, the validity of statistical inference rests upon the assumption that the samples are genuinely representative of the populations. Meeting this assumption requires the researcher to use random samples. Here, a *simple random sample* is a sample chosen from the working universe in such a manner that each unit (and combination of units) has an equal chance of being selected (Smith 1991: 155).

However, in some cases a stratified random sampling is preferable. For example, there may be identifiable subgroups of entities within the population that may be expected to have different parameters on a variable of interest to the researcher. Knowing the kinds of difference that exist will help in the understanding of the population as a whole. For this purpose, data will have to be collected in a manner that will help the assessment of the specific characteristic at

each subgroup level in the population. A stratified random sampling will allow data to be collected and meaningfully analysed in this manner (Sekaran 1992: 231).

Owing to the nature of the working universe (eight different trade shows), this research took the approach of stratified sampling so that the samples would better represent the total range of industries being studied. As Smith (1991: 157) suggests, in a *stratified sampling*, the researcher first divides the working universe into homogeneous subparts known as "strata." The researcher then draws a series of random samples from each stratum. The basic principle of stratification is that each stratum should be as homogeneous as possible with respect to the variable under study (Murthy & Roy 1983: 117).

Since this research involves a large number of variables, the general policy in respect of stratification is to adopt a collective approach which aims at reducing the "within stratum" variations of some key characteristics relevant to the variables studied. The eight trade shows, already separate in their own right, were each regarded as a good "stratum" in the research because each show was dedicated to a specific industry. Therefore, the sample would be more homogeneous within the stratum and heterogeneous between strata. Samples were then drawn randomly from each of the shows.

The *sampling frame*, defined by Tull and Hawkins (1990: 466) as a means of representing the elements of the population, was based on the floor-plan (exhibitors' list) in the official guide to each show. For each exhibition, a sample quota was pre-determined based on the scale of the trade show. Then samples were drawn randomly from each show.

4.6.4 Sample Size

Though the time and budget resources of the research were limited, it was recognised that sample size is a key determinant to sampling accuracy. As a

general rule of thumb (Ellis 1994: 175), to obtain accuracy (degree of sampling error) within 10% to 5% of the actual figure, the sample size should be between 100 and 400. It was judged that getting feedback from 100 to 200 questionnaires would be appropriate for this research. As estimated in section 4.4.4, it was hoped that the response rate would be more than 24%. Therefore, six hundred questionnaires were delivered in an attempt to get the necessary 100 to 200 returned.

4.7 Research Biases

"Biases can and do arise from many sources, ..."

(Deming 1947: 115)

Although every effort has been taken to ensure the quality of the research, there are inherent biases caused by the limitations of the research design and the sampling process. As a result, special caution is always necessary when attempting to generalise the research findings to the population, or even to a wider domain. These biases include *post hoc*, cross-sectional, non-response, non-sampling, and non-experimental biases.

4.7.1 *Post hoc* Bias

"Memories are most likely to be distorted when distortion can be used to justify one's actions and maintain or enhance one's self-esteem."

(Stern 1979: 75)

A limitation of the research results from the employment of a *post hoc* research design. The respondents were requested to give information about a segmentation project their companies had conducted or in which they were involved (either in the current company or the company by which the respondent was previously employed). As Emory (1980: 86) argues, "Most respondents have difficulty accurately reporting events from their past unless the events were either

outstanding or recent." It is thus possible that information gathered through this *post hoc* approach might be distorted owing to limited human recall.

Also, Stern (1979: 75) contends that memories can be distorted to fit the view that makes a person most comfortable at present. In the case of this research, for example, the outcome of the segmentation project studied may change what people thought about it earlier on. A segmentation project may be judged as successful because people involved had a pleasant experience in the process. Similarly, its process may be highly rated because the project turned out to be successful.

Still another limitation of this research concerns the accuracy of the answers provided by respondents' participating in the questionnaire surveys. Assael and Keon (1982: 114) refer to this type of bias as *response error.* This type of error is important as even taking into account the problems of recall ability and reliability, the respondents may still, intentionally or unintentionally, provide false information, and hence, bias the research findings.

Although many precautionary measures, such as pre-test, clear answer instructions, easy to follow question layout, explanation of the research purpose, etc., have been taken to ensure the accuracy of the research, not all possible sources of error can be ruled out. Nevertheless, it is important to be aware that these limitations are embedded in all *post hoc* type research and not restricted to this research alone.

4.7.2 Cross-Sectional Bias

"Time is nature's way of keeping everything from happening at once."

(Anonymous, here in Suen & Ary 1989: 59)

Time is an important aspect of research design. To examine a dynamic phenomenon over an extended period requires that the researcher makes several observations rather than just a single snapshot. This type of research is known as

a *longitudinal study* (Sanders & Pinhey 1983: 41). In longitudinal studies, respondents are questioned at different points in time, thus allowing analysis of changes over a period of time (Zikmund 1991: 213).

Owing to the resource constraint, the research was unable to adopt a longitudinal approach. Instead, a cross-sectional method was used. A *cross-sectional* study is one in which data are gathered once, perhaps over a period of days, weeks or months, in order to answer a research question (Sekaran 1992: 109). A major drawback of this type of study is that the investigation cannot follow changes in time. Thus, there may be some other factors that can affect segmentation success which are not obvious at the time of the research. As time goes by, these may evolve and emerge as success factors. Also, there may be some factors which currently have impacts upon segmentation success, but their importance may be declining and will eventually vanish. These factors cannot be identified in a cross-sectional research design. In addition, a cross-sectional study can be described as a snapshot that attempts to freeze the topic so that only that one slice of time is carefully examined. This makes it difficult to establish causality relations between independent and dependent variables of the research.

In spite of all the defects, when compared with a longitudinal design, a cross-sectional research design is easier to conduct. Thus, it is a sensible starting point for developing the motivation required to tackle the generally unfamiliar and admittedly often difficult statistical problems presented by longitudinal research (Davies 1994: 20). In addition, although there is only one occasion of measurement in a cross-sectional study, it is possible to obtain data which refer not only to that occasion but also to previous occasions by asking retrospective questions (Plewis 1985: 6).

Balancing the pros and cons of two approaches (cross-sectional and longitudinal) and resources of the study, it was decided that a cross-sectional method was sensible for the purpose of this research. However, it was acknowledged that caution is needed when drawing conclusions about causal

relationships (see section 7.4.1 for further discussion) in the research as well as when generalising the research findings to different time settings.

4.7.3 Non-Response Bias

There are various reasons why people do not respond to questionnaires. They may be too busy. They may not be in a good mood. They may not have the necessary knowledge to answer the questionnaire, or the topic may be too confidential for the individual's company. Whatever the reason, the people who do not respond to a delivered questionnaire deserve representation. After all, it is possible that, had they responded, their responses might have substantially changed the overall results of the survey. Deming (1947: 115) suggests a face-to-face interview of a subsample of the people who do not return their questionnaires. As the questionnaires were delivered anonymously, the researcher had no way of tracing those people who did not send questionnaires back. Instead, a *wave analysis* (or *trend analysis*), demonstrated by Leslie (1972: 324 & 329), was used to check non-response bias.

Wave analysis assumes that those who return questionnaires last are "almost" non-respondents. Basically, the 243 returned questionnaires were kept in chronological order as they were returned. This filing system made it possible to distinguish the last returned questionnaires from the earlier ones. Wave analysis was then done by performing *Student's t* tests on the 86 completed questionnaires to check if significant differences existed between the statistics of the last fifteen responses and those of the other.

The fifteen cases were chosen balancing two concerns. On one hand, the fewer the responses included in the *last response* group the better, because only the last few cases were really *last responses*. On the other hand, larger sample size tends to reduce sampling error (Roscoe 1969: 156). In this sense, the more cases included in the *last response* group the better. The statistics used for examining differences between the two groups was *Student's t* test which is used

when the sample size is 30 or fewer (Levin 1984: 334). Thus, 15 cases were chosen to be included in the last response group as a compromise between the two aforementioned concerns. Apart from the differences in the scores of factor 4 (*adequate project resources*, significant level 0.03) and factor 9 (*morale and communication*, significant level 0.02), no other significant differences were found between the two groups.

Although the assumption of wave analysis is debatable, if the responses of those returned last are not different from those of the earlier returned questionnaires, it may be reasonable to assume that few non-response biases exist. In this research, group differences existed in only two of the ten success factors. So, the non-response biases can be considered as negligible.

4.7.4 Non-Sampling Bias

The rationale behind non-sampling bias is that information obtained from one group of the population may not be valid for another group. For example, ascription of the preferences of old people to young people in the music business may lead to serious marketing and advertising mistakes.

In this research, samples were drawn from companies who participated in the trade shows at the NEC. According to Faria and Dickinson (1986: 152), firms with low market share (less than 5%) and those with very high market share (more than 20%) consider trade shows more important in their marketing programmes than companies with only moderate market share. Also, firms with five or more product lines are less likely to rate trade shows as very important. This research, although unintentionally, might have overlooked those companies with moderate market share and those with five or more product lines. Therefore, special caution has to be taken when trying to generalise research findings to those companies which do not participate in trade shows.

4.7.5 Non-Experimental Bias

Because of its non-experimental nature, the present research is unable to manipulate independent variables. Also, it lacks the power to randomise independent variables. Thus, the "truth" of the hypothesised relationship between independent variables and dependent variables cannot be asserted with the confidence of an experimental situation. That is, although possible intervention from extraneous variables has been ruled out (see section 6.4.3), the present research cannot interpret the causal relationships between independent and dependent variables as strongly as experimental research could. Therefore, any interpretation of definite causal relationships between the two variables will be premature. Issues relating to causal inference will be further discussed in section 7.4.1.

4.8 Data Preparation and Analysis

Survey data that rely on voluntarily returned questionnaires are subject to many sources of error. People may fail to recall events correctly, unintentionally provide false information, neglect to answer certain questions, deliberately distort the truth, refuse to participate, and so on. As computer jargon says, *garbage in, garbage out.* These issues, if not dealt with properly, may lead to biased results. It is almost impossible to detect all of the above errors. However, there are at least some measures that can be taken to minimise errors rather than haphazardly plunging into the search for statistical significance. The data examination measures included in this section are: questionnaire screening, data entry and data check. Also reported in this section are sample profiles of the research. The statistical analysis of the data will be discussed in detail in Chapters Five and Six.

4.8.1 Questionnaire Screening

In total, 243 questionnaire responses were received from the survey. Each response was carefully checked for errors. The result of this check revealed that in

some cases pages four and five (questions related to *a specific segmentation project*) were not answered. If name and address details were complete these responses were sent back to the respondents, together with a letter (see Appendix 6), asking for the additional questions to be completed. Otherwise, only the information up to question 18 was used. A few questionnaires were found to be haphazardly answered. For example, the answers in question 26 of a returned questionnaire were ticked along the same degree all the way down. This type of answer pattern was considered to be unhelpful. Such questionnaires were deemed unusable and were discarded. During the screening procedure, 22 questionnaires were taken out of the returned pile, and 221 remained usable.

4.8.2 Data Entry

With the help of the Warwick Computing Service (WCS), an optical scan method was used to capture all of the questionnaire data on computer. This was done by using a light pen to go through all of the ticked boxes on the questionnaires. The ticks detected by the light pen were mapped to a pre-set questionnaire on the computer. For open-ended questions, the answers were first analysed, categorised and coded by the researcher. The coded numbers were then manually typed onto the computer by the WCS. Later, all the data were transferred to SPSS format by a tailor-made FORTRAN programme. This computerised data transcription minimised errors that could possibly have been caused by manual data input.

4.8.3 Data Check

Even with the help of a sophisticated optical scanner device, errors might still exist in the transcription of data to the computer. To ensure that all data were correctly captured on the computer, a verification check was needed. This was done by printing the computerised data to check if they corresponded to the questionnaire data. In addition, descriptive analyses, such as means, standard deviations, data ranges, frequencies and distributions of all the variables were

checked to see if the data were correctly digitised onto the computer and that there were no abnormal outliners or extreme values.

During the check, it was found that one column of the data was missing and that there was an abnormal value "7" in one of the variables. Later, it was found that there were minor FORTRAN programme mistakes during the transformation of scanned data onto the SPSS data set. Manual corrections were made to rectify these problems. Once this process was complete, another check was performed and no additional errors were detected.

4.8.4 Sample Profiles

An introductory and broad view of the returned questionnaires is given in this section. This summary of data is presented in table form showing the 243 samples as a whole as well as the 86 completed questionnaires as sub-groups. As the purpose of this section is to draw a basic profile of the sample, discussion about the characteristics of the samples will be brief. In the tables presented subsequently, any fluctuations in the sample size are the results either of the missing values or "don't know" answers.

Table 4-4 and Table 4-5 show the summary of the questionnaires collected from the eight NEC trade shows. Of the 221 usable questionnaires, 135 were half completed and 86 were fully completed. *Half completed* means that both the companies and the respondents were not experienced in conducting a segmentation project. So, as the respondents finished question number 20, they skipped to the last question, leaving questions 21 to 33 unfilled. *Fully completed* means that either the respondent's company had at some point conducted a market study containing a segmentation project or the respondent himself had been involved in a segmentation project. These 86 fully completed questionnaires were vital to the investigation of critical success factors for a segmentation project.

Table 4-6 shows the years of operation of the respondent companies. The samples were equally spread in the first four categories (fewer than 30 years), with about 30% of the companies operating more than 30 years. Table 4-7 shows the number of employees of the respondents' companies. Half of them had fewer than 50 employees, indicating that most of them were small to medium size companies. Table 4-8 shows that most of the companies had combined marketing and sales departments, with fewer than 20 department employees. Table 4-9 shows more than 70% of the companies had annual turnovers below £10 million. Table 4-10 shows that around 70% of samples were British owned companies. Table 4-11 shows sales force and trade fairs were the two most relied on information sources, followed by information from dealers, distributors, and customers, as well as observation of markets by senior management. Only about 10% of the companies used outside consultancy organisations as information sources. Tables 4-12 to 4-14 show that around 50% of the companies had customer numbers of fewer than 999. About 50% of the companies contacted fewer than half of their customers monthly and most of the customers were located in the UK. As for the respondents' job title, Table 4-15 shows that more than 60% were marketing people.

Table 4-4 Profile of Returned Questionnaires (I)

Trade shows	Date (1994)	Questionnaires Delivered	Returned (%)	Usable (%)
Autumn Ideal Homes Show	22-30/10	60	41 (68.3)	38 (63.3)
IWEX: International Water and Effluent Treatment Exhibition	8-10/11	110	57 (51.8)	51 (46.4)
Rooftec & Building Fabric '94	8-10/11	35	11 (31.4)	10 (28.6)
ASFI: Associated Suppliers to the Furniture Industry	20-24/11	100	30 (30.0)	27 (27.0)
WOODMEX	20-24/11	50	10 (20.0)	8 (16.0)
Software Development	22-24/11	50	21 (42.0)	19 (38.0)
Tooling	22-24/11	45	18 (40.0)	17 (37.8)
Manufacturing Week	22-24/11	150	55 (36.7)	51 (34.0)
Total	-	600	243 (40.5)	221 (36.8)

Table 4-5 Profile of Returned Questionnaires (II)

Trade shows	(1) Usable	(2) Fully Completed	(%) (2)/(1)	(%) (2)/86
Autumn Ideal Homes Show	38	5	13.2	5.8
IWEX: International Water and Effluent Treatment Exhibition	51	21	41.2	24.4
Rooftec & Building Fabric '94	10	4	40.0	4.7
ASFI: Associated Suppliers to the Furniture Industry	27	7	25.9	8.1
WOODMEX	8	5	62.5	5.8
Software Development	19	10	52.6	11.6
Tooling	17	10	58.8	11.6
Manufacturing Week	51	24	47.1	27.9
Total	221	86	38.9	100.0

Table 4-6 Profile of Operation Years

Years of operation	Overall		Completed	
	Frequency	%	Frequency	%
5 or fewer	36	16.4	13	15.1
5- fewer than 10	45	20.5	17	19.8
10 - fewer than 20	38	17.3	14	16.3
20 - fewer than 30	33	15.0	14	16.3
30 or more	67	30.5	27	31.4
Don't know	1	0.5	1	1.2
Total	220	100.0	86	100.0

Table 4-7 Profile of Employee Numbers

Number of employees	Overall		Completed	
	Frequency	%	Frequency	%
20 or fewer	98	44.3	33	38.4
21 - 49	37	16.7	15	17.4
50 - 99	28	12.7	12	14.0
100 - 499	43	19.5	19	22.1
500 - 999	7	3.2	3	3.5
1,000 or more	8	3.6	4	4.7
Don't know	0	0.0	0	0.0
Total	221	100.0	86	100.0

Table 4-8 Profile of Marketing/Sales Departments

Number of department employees	Marketing/Sales combined	Marketing	Sales	None
5 or fewer	94	27	13	-
6 - 19	32	10	17	-
20 - 49	7	1	9	-
50 - 99	0	0	2	-
100 or more	0	1	3	-
Don't know	0	1	1	-
Total	133	49	64	22

Table 4-9 Profile of Company's Turnover

Company's 1993 turnover	Overall		Completed	
	Frequency	%	Frequency	%
Under £1 million	69	32.1	21	25.3
£1 - £9 million	100	46.5	44	53.0
£10 - £49 million	26	12.1	10	12.0
£50 - £99 million	6	2.8	3	3.6
Over £100 million	8	3.7	4	4.8
Don't know	6	2.8	1	1.2
Total	215	100.0	83	100.0

Table 4-10 Profile of Company Ownership

Company ownership	Overall		Completed	
	Frequency	%	Frequency	%
Mainly British owned	159	72.9	58	69.0
Jointly British and foreign owned	16	7.3	6	7.1
Mainly foreign owned	43	19.7	20	23.8
Total	218	100.0	84	100.0

Table 4-11 Profile of Information Sources

Information sources	Overall		Completed	
	Frequency	% of 221	Frequency	% of 86
Observation of markets by senior management	124	56.1	59	68.6
Research/survey by marketing people	64	29.0	36	41.9
Information from sales force	157	71.0	73	84.9
Information from dealers, distributors, & customers	136	61.5	61	70.9
Outside consultancy organisations	21	9.5	11	12.8
Trade fairs or exhibitions	163	73.8	63	73.3
Published material, company reports, trade directories, etc.	99	44.8	48	55.8
Other	20	9.0	4	4.7
Total	221	100.0	86	100.0

Table 4-12 Profile of Customer Numbers

Customer number	Overall		Completed	
	Frequency	%	Frequency	%
99 or fewer	26	12.2	8	9.8
100 - 399	59	27.7	21	25.6
400 - 999	38	17.8	15	18.3
1,000 - 2,999	35	16.4	14	17.1
3,000 or more	41	19.2	22	26.8
Don't know	14	6.6	2	2.4
Total	213	100.0	82	100.0

Table 4-13 Profile of Customer Connection

Proportion of customers contacted	Overall		Completed	
	Frequency	%	Frequency	%
None	8	3.7	0	0.0
Fewer than half	115	53.5	47	56.7
About half	36	16.7	13	15.7
More than half	19	8.8	10	12.0
Almost all	23	10.7	9	10.8
Don't know	14	6.5	4	4.8
Total	215	99.9	83	100.0

Table 4-14 Profile of Customers' Geographic Location

Customers' geographic location	Overall	Completed
	Frequency	Frequency
Local	16	4
In the UK	155	56
In Europe	39	14
Throughout the world	64	32
Don't know	2	1

Table 4-15 Profile of Respondents' Job Titles

Respondents' job title	Overall		Completed	
	Frequency	%	Frequency	%
Owner, partner, or managing director	46	22.1	15	18.3
Marketing/sales manager	132	63.5	56	68.3
Production/engineer	11	5.3	4	4.9
R&D, product design	5	2.4	2	2.4
Other	14	6.7	5	6.1
Total	208	100.0	82	100.0

An overview of the respondents was presented in this section to help to draw a basic profile of the sample. Of the 600 delivered, 243 questionnaires were returned. The response rate was 40.5% (243/600), a relatively high rate for this type of study. This high response rate may be attributable to many factors, such as the clear instructions, easy to follow question layout, self addressed envelopes and personal delivery.

4.9 Validating Interviews

> *"By combing the two* [quantitative and qualitative approaches], *the researcher's claims for the validity of his or her conclusions are enhanced if they can be shown to provide mutual confirmation."*
>
> *(Bryman 1992: 131)*

Phase three of the research involved the validating interviews. The purpose of this phase was to discuss the research findings with practitioners in an attempt to explain the findings. Four marketing managers who had previously participated

in the pilot interview stage and who had shown an interest in discussing the findings further were contacted.

In the interviews, the questionnaire was presented. The data analysis procedure was discussed and the results of the analysis explained. The practitioners were then asked to give comments. Specifically, they were asked whether the results made sense to them; whether they thought the results might be helpful in their future engagement with segmentation. They were also asked how they would interpret the results. Each of the interviews lasted between forty minutes to one hour.

The opinions of the practitioners and the results from the quantitative techniques proved to be consistent. The respondents agreed with the findings of the research and gave many useful comments. For example, one set of comments resulted in the development of the *upstream segmentation* concept (see section 6.3.3). The information obtained from the interviews greatly helped the interpretation of the results. The comments from the practitioners are discussed in detail in Chapters Six and Seven.

4.10 Summary

A research project is a sequence of highly interrelated activities. It requires careful planning in an orderly investigation to ensure quality. This chapter illustrates the methodological approach used.

The research proceeded in a series of three interrelated phases, qualitative first, quantitative next and then qualitative again. The reasons for adopting both qualitative and quantitative methods have been presented. The variables investigated in the research have been discussed. To collect qualitative data to help the focusing of the research topic in the early stage, desk research and pilot interviews were used. To collect quantitative data, a survey method was adopted. Issues important to ensuring that reliable data were obtained have been explained.

They include: questionnaire design, pre-test, measures taken to increase response rate, reliability and validity concerns. The research design is put into action by a sampling approach. Eight trade shows at the NEC were chosen as the population of the research. Samples were then randomly drawn from them. Possible research biases have been investigated. In the analysis stage, the data were edited and scanned onto the computer. Before statistical analysis, data were carefully checked to keep any possible errors to a minimum. Sample profiles were presented. Detailed statistical analysis will be reported in Chapters Five and Six. Finally validating interviews were conducted in an attempt to explain the research findings.

5. Analysis and Results

5.1 Flow of Analysis
5.2 General Findings
5.3 Hypotheses Testing
5.4 Summary

This chapter presents the analysis of the questionnaire data. There are three main parts to the chapter. *First*, the flow of analysis is presented. Table 5-1 is designed to act as a guide for checking relationships between the independent and dependent variables as well as deciding suitable statistical analyses for investigating the relationships between the variables. *Secondly*, general findings relating to real business world segmentation practice are shown. The techniques used in this section are mainly descriptive, which enable the researcher to describe a collection of information about the respondents. *Thirdly*, the results of the hypotheses testing are presented. This section deals mainly with the ten factors extracted from section 5.2 and their relationships with segmentation success.

5.1 Flow of Analysis

Table 5-1 shows the relationships between independent and dependent variables investigated in the research, the flow of the analysis, and the main statistical techniques used in each part of the analysis. For example, the ***A-A*** cell in the table shows that descriptive statistical techniques were used to summarise the demographic characteristics (Q.1-12) of the questionnaires, and that the results are presented in section 4.8.4. In the ***F-I*** cell, ***F*** (Q.21-25) were used as independent variables and ***I*** (Q.30-33) were used as dependent variables. The statistical technique used was ANOVA and the results are presented in section 6.5.6. A special case in this table is the ***I-G*** cell, which is located below the diagnostic line of the table. In this cell, ***G*** (Q.26-27) were used as independent variables and ***I*** (Q.30-33) were used as dependent variables for statistical analyses.

The results of the analysis are presented in section 6.1. The cells regarding the main themes of the research are illustrated with bold borders.

The analysis consisted of five steps. The *first* step was to understand the characteristics of the returned questionnaires. Descriptive statistics were conducted to get a clear view of the sample. These sample profiles were presented in Chapter Four. The *second* step, trying to understand real business segmentation practices, focused on the rank order and descriptive summary of some variables. The *third* step was hypotheses testing. *Student's t* test, ANOVA and correlation analysis were used to investigate the relationships between the independent and dependent variables. *Fourthly*, to further study the characteristics of the independent and dependent variables, a reverse check, that is, using former independent variables as dependent variables and using former dependent variables as independent variables, was employed. The results of the reverse check will be presented in the next Chapter. *Finally*, cluster analysis was used to classify the cases into different groups. The characteristics of each group of cases were then analysed. These results will also be presented in Chapter Six.

Table 5-1 Statistical Techniques and Flow of Analysis

Independent Variables		Dependent Variables								
		A	B	C	D	E	F	G	H	I
		1-12	13-15	16-17	18	19-20	21-25	26-27	28-29	30-33
A	1-12	*Summary* 4.8.4 *	*ANOVA* Appendix 7.1	χ^2 Appendix 7.2	*ANOVA* Appendix 7.3	χ^2 Appendix 7.4		*ANOVA* Appendix 7.5		
B	13-15		*Ranking* 5.2.1							
C	16-17			*Summary* 5.2.2						
D	18				*Summary* 5.2.3	χ^2 Appendix 7.4		*CORR* Appendix 7.5		*T-test* Appendix 7.6
E	19-20					*Summary* 5.2.4				
F	21-25						*Summary* 5.2.5			*ANOVA* Appendix 7.6
G	26-27							*Summary Factor* 5.2.6		*T-test Cluster Discriminant* 5.3; 6.2
H	28-29								*Summary* 5.2.7	*CORR* Appendix 7.6
I	30-33							*T-test* 6.1		*Summary* 5.2.8

Key themes of the research →

A:	Q.1-12	sample demographics	Nominal scale
B:	Q.13-15	perception of segmentation	Interval scale
C:	Q.16-17	usefulness of segmentation	Nominal scale
D:	Q.18	understanding and adoption of segmentation	Interval scale
E:	Q.19-20	experience in conducting segmentation	Nominal scale
F:	Q.21-25	project attributes	Nominal scale
G:	Q.26-27	degrees of implementation	Interval scale
H:	Q.28-29	different stages of segmentation	Interval scale
I:	Q.30-33	measurement of success	Interval scale

* Indicates sections where the results are presented

5.2 General Findings

The first part of the questionnaire is about company demographics, which gives the profiles of the respondents and is presented in section 4.8.4. This section deals with descriptive analysis of the second and third parts of the questionnaire. The second part of the questionnaire is related to *segmentation in general.* It includes the perception of segmentation objectives (Q.13-15), the usefulness of segmentation (Q.16-17), and the understanding and adoption of segmentation concepts (Q.18). The third part of the questionnaire is about *a*

specific segmentation project. It includes companies' segmentation experience (Q.19-20), segmentation project attributes (Q.21-25), the results of factor analysis applied to the thirty one segmentation activities (Q.26-27), segmentation stages (Q.28-29) and segmentation success (Q.30-33).

Owing to its descriptive nature, the discussion will not go into too much detail in this section because the topics discussed here are not the central issues of the research. The only exception is section 5.2.6.2, extraction of factors, which is the foundation for further statistical analyses. In addition to the briefing in section 5.2.6.2, the ten extracted factors will be discussed in greater detail in section 5.3

5.2.1 (Q.13-15) Perception of Segmentation Objectives

Table 5-2 shows the ranking of respondents' perception of the main objectives of a segmentation project. The variables were listed according to the average rating they received. In the five-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree), item (d) *select the most suitable segments* had the mean score of 4.19 and was ranked number one, followed by (a) *understand customers' behaviour and needs.* Item (b) *understand market situations* and (e) *facilitate the development of marketing plans* came third and fourth.

Table 5-2 Perception of Segmentation Objectives

Q.13 The main objectives of a segmentation project are to:	Mean	Rank	Standard Deviation	Sample Size *
a. Understand customers' behaviour and needs	4.13	2	0.67	214
b. Understand market situations	4.05	3	0.74	210
c. Analyse competitors	3.42	9	0.92	207
d. Select the most suitable segments	4.19	1	0.83	211
e. Facilitate the development of marketing plans	4.02	4	0.78	207
f. Maximise use of company resources	3.96	5	0.84	211
g. Select major product features to emphasise	3.88	6	0.85	209
h. Determine the price of a product	3.24	10	1.02	205
i. Develop an advertising campaign	3.59	7	0.79	209
j. Choose a distribution channel	3.51	8	0.87	202

* Sample sizes are not the same for all the items owing to missing values

Amongst the ten major segmentation objectives in Table 5-2, respondents were also asked to identify three priorities and number them in order of importance. As Table 5-3 shows, (a) *understanding customers' behaviour and needs* was listed of first importance by 73 of the 181 respondents, followed by (f) *maximising use of company resources* and (d) *selecting the most suitable segments.*

Table 5-3 Important Objectives of a Segmentation Project

Q.15 The three most important objectives of a segmentation project are to:	1st Important		2nd Important		3rd Important	
	*F**	%	*F*	%	*F*	%
a. Understand customers' behaviour and needs	73	40.3	17	9.4	15	8.5
b. Understand market situations	19	10.5	20	11.1	17	9.7
c. Analyse competitors	0	0.0	6	3.3	10	5.7
d. Select the most suitable segments	35	19.3	45	25.0	17	9.7
e. Facilitate the development of marketing plans	2	1.1	23	12.8	23	13.1
f. Maximise use of company resources	38	21.0	28	15.6	41	23.3
g. Select major product features to emphasise	7	3.9	16	8.9	22	12.5
h. Determine the price of a product	2	1.1	4	2.2	11	6.3
i. Develop an advertising campaign	1	0.6	12	6.7	9	5.1
j. Choose a distribution channel	2	1.1	8	4.4	10	5.7
k. Other	2	1.1	1	0.6	1	0.6
Total Frequency	181	100.0	180	100.0	176	100.2

* F: frequency

To obtain an overall score of the importance of segmentation objectives from Table 5-3, a weighted mean method (WMM) was used. In general, the weighted mean of a set of numbers designated X_1, X_2, ..., X_n with corresponding weights W_1, W_2, ..., W_n is computed by (Mason & Lind 1993: 78-79):

$$\overline{X}_w = \frac{X_1W_1 + X_2W_2 + ... + X_nW_n}{W_1 + W_2 + ... + W_n}$$

For example, the weighted score of importance of item Q.15a *understand customers' behaviour and needs* can be obtained by:

$$\frac{73*3+17*2+15*1}{181}=89.33$$

where *3*, *2*, and *1* are the weights for rank *1st*, *2nd* and *3rd* respectively.

Bonoma and Shapiro (1983: 1-2) contend the three major reasons for segmenting a market are: *analysis*, *market selection*, and *marketing management*. They do not suggest which of these is the most important. Also, little empirical evidence can be found regarding the relative importance of these reasons. Although a comparison between Table 5-2 and Table 5-3 found that the two rankings were not exactly the same, it was interesting to note that, in Table 5-4, the five most important segmentation objectives perceived by practitioners are consistent with the research of Bonoma and Shapiro.

Table 5-4 Perception and Importance of Segmentation Objectives

Q.13-15	Perception		Weighted Importance	
Reasons for segmenting a market	Score	Ranking	Score	Ranking
Analysis:				
a. Understand customers' behaviour and needs	4.13	2	89.33	1
b. Understand market situation	4.05	3	38.00	4
Market selection:				
d. Select the most suitable segments	4.19	1	70.67	2
Marketing management:				
e. Facilitate the development of marketing plans	4.02	4	25.00	5
f. Maximise use of company resources	3.96	5	70.33	3

In addition to the findings shown in Table 5-2 to Table 5-4, there were many comments provided by respondents which showed the differing interpretations of segmentation objectives. Table 5-5 is the summary of comments from Q.14 (*In addition to the items in question 13, can you think of any other reasons for conducting a segmentation project?*). All of the comments were compared to the items in Q.13 to see if they were similar to one another. If different interpretations were detected they were put in the *Respondents' Comments* column. These comments help to widen the perspectives of a segmentation project. These

findings indicate that the purpose of a segmentation project should not be confined to the three Bonoma and Shapiro objectives alone. The use of segmentation may be extended to a wider context. For example, a segmentation project may be used for the purpose of maximising profitability, such as increasing sales, market share, etc. Also, it may be used for monitoring, perhaps by ensuring that the right company course is followed and that weaknesses are spotted in the company structure.

Table 5-5 Possible Segmentation Objectives

Q.14 Reasons for conducting a segmentation project:	**Respondents' Comments**
a. Understand customers' behaviour and needs	• Break into new customers in the same segment • Develop a close relationship with customers
b. Understand market situations c. Analyse competitors	
d. Select the most suitable segments	• Focus company efforts
e. Facilitate the development of marketing plans	• Develop a programme of added value on existing products • Maximise efforts of company towards customer satisfaction and profit
f. Maximise use of company resources	• Utilise spare facilities and people
g. Select major product features to emphasise	• Alter products to meet customers' needs • Know potential product development • Identify new product opportunities • Determine direction of future product development
h. Determine the price of a product i. Develop an advertising campaign j. Choose a distribution channel	
k. Other (Maximise profitability)	• Increase sales • Increase market share • Maximise marketing effectiveness • Maximise profitability
l. Other (Monitor)	• Ensure the right company course • Spot weaknesses in company structure • Rationalise organisation

5.2.2 (Q.16-17) Usefulness of Segmentation

Most marketing literature assumes that segmentation is beneficial to a company (e.g., Assael & Roscoe 1976; Bertrand 1989). However, not all marketers may think so. In Table 5-6, sixteen percent of the 212 respondents thought segmentation was not beneficial to their companies. Analysis of the reasons for this negative perception of segmentation benefits showed that out of the 34 respondents, 50% considered that *nobody in the company knew what segmentation was about.* The second most mentioned reason was that *the market is very small,* followed by *segmentation doesn't work.*

Table 5-6 Statistics of Segmentation Usefulness

Q.16 Whether segmentation is beneficial to the company	Frequency	%
Yes	138	65.1
No *	34	16.0
Don't know	40	18.9
Total	212	100.0

* Further break down in Table 5-7

Table 5-7 Reasons for Rejecting Segmentation (N=34)

Q.17 Segmentation is not beneficial because:	Frequency	%
There are few customers	6	17.6
The market is very small	10	29.4
There is weak competition	4	11.8
Segmentation doesn't work	7	20.6
Nobody knows about segmentation	17	50.0
Other	3	8.9

Young *et al.* (1978: 405) contend that in some instances segmentation may not be useful to a company: when the market is so small that marketing to a portion of it is not profitable; when heavy users make up such a large proportion of the sales volume that they are the only relevant target; and when the brand is the dominant brand in the market. This study shows that, while these three situations represent occasions when segmentation is not beneficial to a company,

perhaps an even more important situation is the level of understanding which individuals within the organisation have about segmentation. This may suggest that an important consideration in a company's adoption of a segmentation strategy lies in the training and education of the company's employees on segmentation practice.

5.2.3 (Q.18) Understanding of Segmentation

Table 5-8 shows the degree to which segmentation concepts were understood by people with different job titles, and the degree to which segmentation concepts were adopted by companies within the different industries. For a dichotomy comparison, responses of 1 (strongly disagree), 2 (disagree), and 3 (neither disagree nor agree) were categorised as *low degree*. Responses 4 (agree) and 5 (strongly agree) were grouped as *high degree*, and 6 (don't know) was treated as a missing value. Only 45.4% of the top management, 61.4% of the marketing people, and 28.6% of the designing people claimed to have a good understanding of segmentation. At a more general level, understanding of segmentation concepts was claimed by only 30.7% of the people across different industries, while only 28.1% of the respondents considered segmentation concepts were widely adopted in marketing planning by companies in their industries.

Table 5-8 Understanding and Adoption of Segmentation

Q.18 Segmentation concepts are:	Sample Size	Low Degree of Understanding		High Degree of Understanding	
		Frequency	%	Frequency	%
a. Understood by the top management	196	107	54.6	89	45.4
b. Understood by the marketing people	197	76	38.6	121	61.4
c. Understood by the product designing people	182	130	71.4	52	28.6
d. Understood in the industry	189	131	69.3	58	30.7
e. Widely adopted in the industry	178	128	71.9	50	28.1

Most of the marketing literature assumes that segmentation is well understood by practitioners (e.g., Piercy & Morgan 1993: 123) and widely adopted

in real world marketing (e.g., Young *et al.* 1978: 405). To date, there has been little empirical evidence supporting these arguments. The results from the study show that segmentation concepts may not be as well understood by practitioners as previously sometimes argued. This misconception implies that a substantial training programme may be needed if a company wants to make the best use of this practical strategic marketing tool.

5.2.4 (Q.19-20) Experience of Segmentation

The third part of the questionnaire is related to *a specific segmentation project.* This part looks at the most recent market study containing a segmentation project which the respondent's company has undertaken (Q.19) or in which the respondent has been personally involved (Q.20). If both of the answers to questions 19 and 20 are *no* or *don't know* the respondents are free to skip to Q.34. Otherwise, they are asked to give their opinions about that specific project.

Table 5-9 shows that 77 companies out of the 219 surveyed had conducted a segmentation related market study. Table 5-10 shows that 70 respondents had been directly involved in a segmentation project. The combination of the *yes* answers in the two questions comprised the 86 fully completed questionnaires in the research.

Table 5-9 Segmentation Experience of Companies

Q.19 Companies' segmentation experience	Frequency	%
Yes	77	35.2
No	111	50.7
Don't know	31	14.2
Total	219	100.0

Table 5-10 Segmentation Experience of Individuals

Q.20 Respondents' segmentation experience	Frequency	%
Yes	70	32.0
No	149	68.0
Total	219	100.0

5.2.5 (Q.21-25) Project Attributes

This section discusses some attributes of the segmentation project surveyed. The purposes of the specific market study and the product life cycle stage of the product being studied are considered.

5.2.5.1 Purposes of the Market Study

Out of the 86 fully completed questionnaires, Table 5-11 shows that 46.3% of the respondents gave the main purpose of the study as "to understand market situation," and 18.8% of them cited "to understand customers' behaviour and needs" as the main purpose. These two purposes can be categorised as *market analysis* according to the three segmentation reasons suggested by Bonoma and Shapiro (1983: 1-2).

Table 5-11 Main Purposes of the Market Study

Q.21 Main Purposes of the Market Study	Frequency *	%
a. Understand customers' behaviour and needs	15	18.5
b. Understand market situations	37	45.7
c. Analyse competitors	2	2.5
d. Select the most suitable segments	5	6.2
e. Facilitate the development of marketing plans	11	13.6
f. Maximise use of company resources	2	2.5
g. Select major product features to emphasise	3	3.7
h. Determine the price of a product	1	1.2
i. Develop an advertising campaign	1	1.2
j. Choose a distribution channel	0	0.0
k. Other	4	4.9
Total	81	100.0

* Total frequency is not equal to 86 owing to missing values.

In addition to the categorisation of the main purposes of the market study presented in Table 5-11, there are many comments from the respondents which make different interpretations of the main purpose of a market study. These comments are sorted and categorised and are presented in Table 5-12. These comments give fresh ideas about how the purposes of a market study can be interpreted.

Table 5-12 Comments on Main Purposes of the Market Study

Q.21 Main purposes of the market study:	**Respondents' Comments**
a. Understand customers' behaviour and needs	• Know customer needs and preference • Analyse customer profile • Build relationships with customers
b. Understand market situations	• Define sizes of the market • Find out potential markets • Understand the dynamics of the markets
c. Analyse competitors	
d. Select the most suitable segments	• Decide where to sell • Help focus our efforts in specific areas
e. Facilitate the development of marketing plans	• Raise awareness of the company • Improve service to a particular segment
f. Maximise use of company resources	
g. Select major product features to emphasise	• Decide which product lines to promote • Determine features required for a new product development • Study the feasibility for new product development • Justify involvement in a new product development
h. Determine the price of a product	
i. Develop an advertising campaign	• Develop packaging of products
j. Choose a distribution channel	
k. Other	• Determine future strategy • Look at the best way forward for the company

5.2.5.2 Product Life Cycle and Segmentation

The *Product life cycle* (PLC) is a concept widely adopted in marketing (e.g., Day 1981; Thorelli & Brunett 1981). In the segmentation arena, Cravens *et al.* (1976: 242-243) claim that during the earlier stages of the PLC companies may

concentrate their efforts on segmenting a market based on the product type (e.g., box, tin or glass for packaging needs). As the number of competitors increases in each segment, there is pressure for companies to differentiate their offers. So, the companies may segment their markets according to a more subtle base, that is, different preferences (e.g., price, quality and delivery) among customers for the same product. However, there has been little empirical research relating the PLC concept to market segmentation.

This research indicates a new attempt to investigate the practices of segmentation in relation to the PLC concept. Table 5-13 shows that most of the segmentation projects were carried out in the earlier PLC stages (20.5% for *very new*, 29.5% for *young* and 39.7% for *mature* product). Rangan *et al.* (1992: 72) claim that segmenting customers on size, industry or product benefits alone is not sufficient in mature industrial markets. The focus of this research meant it was not appropriate to explore further how segmentation strategy is used in the different PLC stages. However, the relationship between the PLC and segmentation is an interesting topic for further research.

Table 5-13 Product Life Cycle of the Specific Product

Q.23 Product life cycle	Frequency *	%
Very new	16	20.5
Young	23	29.5
Mature	31	39.7
Ageing	4	5.1
Don't know	4	5.1
Total	78	99.9

* Total frequency is not equal to 86 owing to missing values.

5.2.6 (Q.26-27) Segmentation Activities

Question 26 concerns the main issue of the research, that of the activities believed to impact upon segmentation success. There are 31 sub-questions within it. This section presents the means, standard deviations and ranking of the 31 segmentation activities. The ten factors extracted from the 31 segmentation

activities are discussed and will be used as independent variables in the subsequent analysis (section 5.3). Respondents' comments concerning segmentation difficulties are summarised in this section.

5.2.6.1 Descriptive Statistics

Table 5-14 shows the means, standard deviations, and rankings of the 31 segmentation activities. "Your company's ability to fulfil the needs of the customers in the selected target markets was evident" has the highest average score. This may imply that most companies were confident before they plunged into the real business of serving the customers.

Table 5-14 Means and Standard Deviations of Segmentation Activities

Q.26 The degree to which respondents agree that the following activities are involved in the specific segmentation project	Mean Score	Mean Score Ranking	Standard Deviation	Sample Size
1. formal procedures	3.12	29	0.95	78
2. clear objectives	3.62	11	0.88	79
3. consensus on objectives	3.36	19	0.81	78
4. qualified personnel	3.85	3	0.88	81
5. senior marketing manager involvement	3.82	4	1.02	82
6. top management support	3.85	2	1.07	82
7. internal communication	3.58	12	0.85	84
8. morale	3.73	6	0.85	82
9. adequate budget	3.23	22	0.98	78
10. sufficient time	3.15	27	0.96	82
11. collection of market/customer data	3.55	14	0.97	83
12. competitor information	3.19	25	1.05	78
13. using statistical packages	2.57	31	1.09	77
14. awareness of customers' needs	3.69	9	0.82	85
15. dividing customers using different methods	3.21	23	0.95	80
16. grouping of similar customers	3.71	8	0.88	79
17. evaluating each customer group	3.68	10	0.87	79
18. selecting customer groups systematically	3.58	13	0.87	84
19. analysing opportunities & threats	3.73	7	0.96	81
20. analysing strength & weakness	3.73	5	0.96	82
21. evident company capability	3.90	1	0.81	83
22. clear customer profile	3.50	16	0.91	82
23. knowing how to compete	3.40	18	1.00	83
24. easily transformed results	3.55	15	1.03	83
25. reallocating resources	3.26	20	1.21	84
26. marketing mix based on results	3.49	17	1.01	82
27. continuous monitoring of progress	3.20	24	1.12	83
28. customers' opinion survey	3.05	30	1.20	84
29. regularly reviewing market dynamics	3.13	28	1.02	85
30. reviewing performance	3.24	21	1.05	84
31. documenting the process	3.18	26	1.10	84

5.2.6.2 Extraction of Factors

Factor analysis proceeds by identifying groups of variables that are interrelated and are thus component measures of a larger more aggregate

dimension, called a factor. In this study, factor analysis was applied to reduce the variables of segmentation activities to a smaller number of overall dimensions which are manageable and interpretable and yet contain most of the original information. This section reports the procedures and results of the analysis.

As discussed in section 3.5.1.1, Kaiser-Meyer-Olkin (*KMO*) index and Bartlett's test of sphericity are two indicators for checking if it is appropriate to perform factor analysis. The *KMO* Measure of Sampling Adequacy is 0.78, and the significance level of Bartlett's Test of Sphericity is 0.00. These two indicators show the validity of conducting factor analysis on the data. In addition, Cronbach's Alpha values of the ten factors range from 0.52 to 0.88, suggesting the instrument is reliable (Nunnally 1967: 226).

In this study, principal components and direct *oblimin* rotation, with eigenvalue ≥ 0.90 was used as the criterion for deciding the number of factors (see sections 3.5.1.2 and 3.5.1.3 for explanation). Table 5-15 is the factor correlation matrix, which contains the correlations amongst the factors. Though some of the factors are correlated, the employment of oblique rotation helps clarify the interpretation of the factors.

Table 5-15 Factor Correlation Matrix

Factor	1	2	3	4	5	6	7	8	9	10
1	1.00	0.35**	0.24*	0.09	0.21*	0.19	0.16	0.13	0.22*	0.11
2		1.00	0.11	0.15	0.08	0.08	0.09	0.07	0.12	0.02
3			1.00	0.17	0.27**	0.12	0.10	0.06	0.29**	0.16
4				1.00	0.10	0.13	0.07	0.12	0.18	0.18
5					1.00	0.18	0.18	0.18	0.16	0.08
6						1.00	0.22	0.24*	0.19	0.17
7							1.00	0.17	0.19	0.15
8								1.00	0.07	0.08
9									1.00	0.19
10										1.00

* Significant at the 95% level
** Significant at the 99% level

Table 5-16 shows the results of the factor analysis for the 31 segmentation activity variables. Ten factors accounting for 76.7% of the total variance were extracted. Although all of the loadings of factors 2, 6 and 9 were originally negative, all the questions in the three factors were set up the same way, so *all* of the signs of these three factors were changed to give a consistent positive sign, leading to easier reading in the later analysis. This reverse of signs of factor loadings was acceptable because it does not affect the results (Child 1990: 36; see section 3.5.1.2 for explanation).

Referring to Table 5-16, the ten factors were interpreted by examining their component variables. The *first* factor, quality results, identified five variables with factor loadings ranging from 0.82 to 0.65, explaining 31.7% of the total variance. These variables were: documenting the process, reviewing performance, easily transformed results, clearly defined customer profile and knowing how to compete. The *second* factor, action on results, consisted of marketing mix based on results, reallocation of company resources, continually monitoring progress and regularly reviewing the marketing dynamics, with factor loadings ranging from 0.78 to 0.68. The *third* factor, management support, was highly correlated with three variables: senior marketing manager involvement, qualified personnel and top management support, with factor loadings of 0.83, 0.83, and 0.82 respectively. The *fourth* factor, adequate project resources, had four variables: adequate budget, competitor information, sufficient time, and collection of market/customer data. These four factors explain over 50% of the total variance.

The remaining six factors explain an additional 22.5% of the variance. The *fifth* factor, SWOT analysis, comprised analysing external opportunities and threats; analysing internal strength and weakness; and the company's capability, with factor loadings ranging from 0.86 to 0.73. The *sixth* factor, formality, consisted of three variables: consensus on objectives, clear objectives and formal procedures, with factor loadings ranging from 0.86 to 0.67. The *seventh* factor, customer group selection, had two variables with high factor loadings that reflect

the evaluation and selection of customer groups. The *eighth* factor, the use of statistical packages, consisted of using statistical packages, customers' opinion survey, and dividing customers by using different methods. Factor *nine*, morale and communication, comprised high morale and internal communication, with factor loadings of 0.81 and 0.50. Lastly, the *tenth* factor, knowledge of the customer, comprised understanding customers' needs and grouping of similar customers.

The next analysis stage was to investigate the relationship between these factors and segmentation success. This involved using the ten factors as independent variables and segmentation success as the dependent variable. Also, the factors were used to classify the 86 cases into different groups so that their characteristics could be explored further.

Table 5-16 Extraction of Factors

Factor	Activities	Factor loading *	Eigen-value	Alpha value	Cumulative percent
1. Quality results	31. documenting the process	0.82	9.84	0.88	31.7
	30. reviewing performance	0.80			
	24. easily transformed results	0.77			
	22. clear customer profile	0.68			
	23. knowing how to compete	0.65			
2. Action on results	26. marketing mix based on results	0.78	2.86	0.84	41.0
	25. reallocating resources	0.75			
	27. continuous monitoring of progress	0.72			
	29. regularly reviewing market dynamics	0.68			
3. Management support	5. senior marketing manager involvement	0.83	2.19	0.79	48.0
	4. qualified personnel	0.83			
	6. top management support	0.82			
4. Adequate project resources	9. adequate budget	0.78	1.94	0.69	54.2
	12. competitor information	0.75			
	10. sufficient time	0.67			
	11. collection of market/customer data	0.54			
5. SWOT analysis	19. analysing opportunities & threats	0.86	1.58	0.81	59.3
	20. analysing strength & weakness	0.82			
	21. evident company capability	0.73			
6. Formality	3. consensus on objectives	0.86	1.31	0.69	63.5
	2. clear objectives	0.83			
	1. formal procedures	0.67			
7. Customer group selection	17. evaluating each customer group	0.90	1.09	0.70	67.0
	18. selecting customer groups systematically	0.80			
8. Use of statistical package	13. using statistical packages	0.76	1.07	0.65	70.5
	28. customers' opinion survey	0.62			
	15. dividing customers using different methods	0.60			
9. Morale and communication	8. morale	0.89	1.04	0.76	73.8
	7. internal communication	0.76			
10. Knowledge of customer	14. awareness of customers' needs	0.80	0.90	0.52	76.7
	16. grouping of similar customers	0.51			

* The signs of factor loadings of factors 2, 6 and 9, which were previously all negative, have been changed to positive.

5.2.6.3 Segmentation Difficulties

The investigating of activities included in a segmentation project led to respondent comments about the most difficult elements of the segmentation project. These comments, which are categorised into different groups and are presented in Table 5-17, give specific details of the difficulties involved in segmentation projects. The difficulties include: lack of formality, low management support, poor morale, lack of consensus, organisational politics, limited resources, lack of knowledge, problems with data gathering, data analysis, action on the results, and assessment of success.

As mentioned in section 5.2.4, the results from this study show that segmentation may not be as widely adopted as most people thought. But why is this so? The many difficulties summarised in Table 5-17 may give some clues to the answer. Owing to the qualitative nature of question 27, this research was unable to tell which difficulty plays the most important part in hindering the implementation of a segmentation project. However, managers should bear these difficulties in mind and try to resolve them in their segmentation engagement.

Here, it is worthwhile to note that not all comments were negative. There was a case in which the respondent said that his company continuously followed the segmentation activities as an on-going means of satisfying customers and finding new ones, and that the company experienced no difficulty in adopting segmentation strategy. Perhaps this should be a lesson for those companies who wish to apply the segmentation concept to their advantage!

Table 5-17 Difficult Elements in a Segmentation Project

Q.27 Most difficult elements in the completion and implementation of the segmentation project:	**Respondents' Comments** It was difficult to:
a. Formality	• set objectives • establish segmentation procedures
b. Management support	• get senior management support • have company commitment
c. Morale	• get the motivation • get it started • maintain overall interest and momentum during the life of the project
d. Consensus	• get management consensus • get all noses in the right direction • communicate and co-ordinate
e. Politics	• deal with internal politics • deal with inbuilt bias from senior members who made data fit plan, not the other way round
f. Limited resources	• set aside time, budget and manpower
g. Lack of knowledge	• find knowledgeable personnel • deal with the segmentation complexity for such a small company
h. Data gathering	• collect usable data • obtain relevant or believable data • reach potential customers • contact the real decision makers • get reply from targeted customers
i. Data analysis	• analyse customer requirement • evaluate the market size • find out the overall value of the market • do SWOT analysis
j. Action on the results	• convince senior management to act on the findings • convince the top management to implement the final result • select new markets • decide which segments to concentrate on initially
k. Assessment of success	• assess segmentation success
l. No problems	• We use this system continuously as an on-going means to satisfying existing customers and finding new ones.

5.2.7 (Q.28-29) Segmenting, Targeting and Positioning

Most marketing literature views segmentation as having three different stages: *segmenting*, *targeting* and *positioning*, also referred to as ***STP*** marketing (Kotler 1994: 264). Questions 28 and 29 of the research investigate company intentions to follow the three stages and how far they get in the three stages. The reason for including these questions is that, in practice, a segmentation project does not necessarily go through the three ***STP*** stages. A company might launch a segmentation project and succeed in dividing the market into two or more segments only to find that it is not profitable to go further to the *targeting* and *positioning* stages because the market may be too small, or the company may not have the capability to fulfil the needs in those segments. The intention of these two questions was to investigate how companies carry out and perform in these three stages. From the literature review, it was found that little empirical research has attempted to explore segmentation practices from this angle.

Table 5-18 shows the means and standard deviations of the two questions. Owing to their exploratory nature, not much can be drawn from the analysis. However, it seems interesting to note that *positioning* (developing the company's products/services and related marketing activities to meet the needs of the selected markets) has the highest score in company's attention and yet has the lowest score in its implementation. This result seems to fit with Wind's claim (1978b: 333), that "the most difficult aspect of any segmentation project is the translation of the study results into marketing strategy."

Table 5-18 *STP* Intentions and Successes

Q.28 The extent to which the company wanted:	Mean	Standard deviation	Sample size
Segmenting (divide the market into two or more groups)	3.74	0.87	86
Targeting (select one or more of these groups as company's target markets	4.06	0.78	84
Positioning (develop the company's products / services and related marketing activities to meet the needs of the selected markets	4.11	0.73	83
Q.29 The extent to which the specific market study succeeded in:			
Segmenting (dividing the market into two or more groups)	3.67	0.96	83
Targeting (selecting one or more of these groups as company's target markets	3.77	0.97	83
Positioning (developing the company's products / services and related marketing activities to meet the needs of the selected markets	3.51	1.16	80

5.2.8 (Q.30-33) Success of Segmentation

Baker and Hart (1989: 85) find that while much research exists which can help companies implement segmentation strategies, relatively little work has been done which shows how segmentation strategies influence company performance. Questions 30 to 33 are related to the measure of segmentation and sales success. These questions attempt to investigate the degree to which the two measures are related.

Table 5-19 shows the segmentation success and sales success of the 86 completed segmentation projects. The correlation coefficient between the two measures is 0.61 and it appears, therefore, that there is a high relationship between the two measures. Of course, it is important to note that these two measures are based only on respondents' perception, not necessarily on fact. Also, the mechanism as to how the two measures are related is not clear. However, this coefficient provides a useful index for marketers to associate segmentation success with sales success.

Table 5-19 Segmentation Success and Sales Success

Measure of segmentation and sales success	Segmentation		Sales	
	Frequency	%	Frequency	%
Very unsuccessful	3	3.6	2	2.5
Unsuccessful	4	4.8	2	2.5
Neither unsuccessful nor successful	24	29.0	23	28.8
Successful	33	40.1	26	32.5
Very successful	15	18.1	18	22.5
Don't know	4	5.0	9	11.3
Total	83	100.0	80	100.0

Correlation coefficient between segmentation and sales success was **0.61** **

** Significant at the 99% level

As discussed in section 2.3, the definition of *segmentation success* and the measure of it are still in their early stage of development. They are essential issues in our understanding of segmentation practice and yet, somehow, have been overlooked. To be able to develop a measurement tool calls first for specifying the domain of the construct (Churchill 1979: 67). That is, before a researcher can develop a measurement tool, he needs to know what it is he is trying to measure.

For this purpose, a thorough understanding of the possible constructs of segmentation success as well as of why a particular segmentation project was considered successful and/or unsuccessful is preferable. Table 5-20 summarises the respondents, comments about ways of measuring segmentation success. The

measurements suggested include: sales increase, profit increase, market share increase, customer feedback, customer loyalty, new customers, efficiency, product expansion, company growth, and judgement. Table 5-21 summarises respondents' comments about the reasons why a segmentation project was considered successful. The reasons can be classified into: sales increase, better meeting of customer needs, customer feedback, opening up new markets, utilisation of resources, product expansion and clear guidance. Table 5-22 summarises respondents' comments about the reasons why a segmentation project was considered unsuccessful. The reasons can be classified into: no consensus, lack of manpower, resources and commitment, inability to get good data, unsuccessful action on results and uncontrollable factors.

Table 5-20 Comments on Measuring Segmentation Success

Q.30 How have you been able to measure segmentation success	**Respondents' Comments** The success of segmentation can be measured by:
a. Sales increase	• sales increase; sales growth • sales against planned target • sales results in selected segment • winning contracts
b. Profit increase	• increased profit; profitability growth • profit return
c. Market share increase	• market share increase • good market share • market penetration
d. Customer feedback	• customer responses • rate of positive responses • feedback from distributors • feedback from potential customers
e. Customer loyalty	• increased repeat-buy loyalty
f. New customers	• increase in certain types of customers • the start of selling product to companies identified
g. Efficiency	• more efficient use of sales time
h. Product expansion	• product range expansion • selling a wider spread of products to customers
i. Company growth	• the company's moving towards a complete product line manufacturer
j. Judgement	• experience of 44 years, which has shown the project was going in the right way
k. Unable to measure	• with difficulty • very hard to define segmentation success clearly

Table 5-21 Comments on a Successful Segmentation Project

Q.33 Reasons why the segmentation project was considered successful:	**Respondents' Comments**
a. Sales increase	• increased sales • business could be reached
b. Better meeting customer needs	• enabled the company to identify different customer needs • gave the company a new perception about customer wishes • the target audience was correctly identified
c. Customer feedback	• customer service level rose to exceed their expectation
d. Opening up new markets	• identified new users and enabled the company to offer a product to meet their requirements • new opportunities appeared • opened doors to unknown markets
e. Utilisation of resources	• maximised use of plant equipment
f. Product expansion	• enabled the company to launch a new product and sell to the intended targets • helped to determine whether or not to continue with a product
g. Clear guidance	• provided focus to the whole company • well defined markets to allow concentration • action plans agreed by all • made the company aware of competition

Table 5-22 Comments on an Unsuccessful Segmentation Project

Q.33 Reasons why the segmentation project was unsuccessful:	**Respondents' Comments**
a. No consensus	• no company consensus about the benefit of segmentation
b. Lack of management support	• lack of support from senior management • lack of support from team members at the side of marketing
c. Lack of manpower	• lack of qualified personnel • lack of dedicated project team
d. Lack of resources	• no budget • lack of computer system
e. Lack of commitment	• lack of serious commitment • lack of commitment to modify products to meet specific market needs
f. Inability to get good data	• data weakness
g. Unsuccessful action on results	• unrealistic assessment of capabilities • failure to change product range • implementation of results not progressed
h. Uncontrollable factors	• uncontrollable factors - state of markets, general business climate, etc.

Owing to its exploratory nature, this research did not give a precise definition of segmentation success, nor did it take account of all these possible dimensions in developing an accurate instrument for measuring segmentation success. It is still far from clear how we can accurately measure the success of a segmentation project. However, investigating into Table 5-20 to Table 5-22 greatly helps expand our understanding of the various dimensions of segmentation success as well as helping to build up the conceptual constructs of segmentation success. These can then help future research in developing better measures of segmentation success.

5.3 Hypotheses Testing

So far, the analysis in this research has been mainly descriptive. That is, only the most basic statistical techniques such as means, standard deviations, and frequency counts have been used (section 5.2.6.2 *Extraction of Factors* is the only exception). The purpose of these descriptive analyses has been to give a general view of real business segmentation practices. Starting from this section, inference statistics will be used. That is, the hypothesised relationships between independent variables (factors extracted from segmentation activities) and dependent variables (segmentation success) of the research will be investigated using *Student's t* test, ANOVA, χ^2 independent test, and Pearson γ correlation coefficients.

5.3.1 The Impact of the Factors

As mentioned in section 5.2.6.2, the factor scores of the ten factors extracted from the 31 segmentation activities were calculated and normalised to have means of 0, and standard deviations of 1. The mean factor score was then used as the cutting point for each factor to divide the 86 cases into two different groups, namely the "lower-half" and "upper-half" groups. *Student's t* tests were then

employed to test if a significant segmentation score difference existed between the two groups.

Taking Factor 1 *quality results* for example, using 0 as cutting point the 86 cases can be divided into two groups. The *lower-half* group included 29 cases with factor scores less than 0. There were 50 cases with factor scores equalled or greater than 0. They were categorised as *upper-half* group. The mean segmentation success scores were 3.03 and 4.04 for the two groups respectively. *Student's t* test showed a significant difference between the means of the two groups.

Table 5-23 shows that in seven out of the ten factors, the differences between the two groups were significant at the 5% level. In six out of the ten factors the differences were highly significant at the 1% level, indicating that, in terms of segmentation success, the projects in the *upper-half* groups did perform better than those in the *lower-half* groups.

Table 5-23 Segmentation Success Scores (of Each Factor)

Factor	Activities in Q26 (see Table 5-16 for keys)	Lower Half	Upper Half	Mean Difference	Significance Level
1. Quality results	31, 30, 24, 22, 23	3.03	4.04	1.01	0.00 **
2. Action on results	26, 25, 27, 29	3.34	3.98	0.63	0.00 **
3. Management support	5, 4, 6	3.26	4.00	0.74	0.00 **
4. Adequate project resources	9, 12, 10, 11	3.29	3.98	0.69	0.00 **
5. SWOT analysis	19, 20, 21	3.49	3.85	0.36	0.10
6. Formality	3, 2, 1	3.63	3.71	0.08	0.73
7. Customer group selection	17, 18	3.35	4.00	0.65	0.00 **
8. The use of statistical packages	13, 28, 15	3.61	3.74	0.13	0.56
9. Morale and communication	8, 7	3.21	4.00	0.79	0.00 **
10. Knowledge of the customer	14, 16	3.44	3.94	0.50	0.02 *

* Significant at the 95% level
** Significant at the 99% level

These results are encouraging as they support the notion that *critical success factors* (CSFs) do exist in a segmentation project. The results indicate a strong relationship between how a project is rated in terms of certain variables (the

critical success factors) and how it performs (the segmentation success scores). The higher a project was rated on each of the ten factors, the higher its segmentation success score. In all but three instances the difference was significant.

The ten factors can be divided into two categories. The first category includes those factors with significant difference between the *lower-half* and *upper-half* groups, which can be regarded as CSFs. The second group includes factors without significant difference between the two groups. The two categories of factors will be discussed further in the following two sections.

5.3.2 Critical Success Factors

Amongst the ten factors, factors 1, 2, 3, 4, 7, 9 and 10 showed significant differences between the *lower-half* and the *upper-half* groups. These seven factors can be regarded as CSFs because the success of a segmentation project seems especially dependent upon them.

5.3.2.1 Factor 1: Quality Results

Of the ten factors, the one accounting for the greatest individual amount of the variance, 31.7%, was the "quality results" factor. Variables included in this factor were: documenting the process, reviewing performance, easily transformed results, clear customer profile and knowing how to compete.

It is understandable that the quality of project results is important to segmentation success. Wind (1978b: 333) contends that the most difficult aspect of any segmentation project is the translation of the study results into marketing strategy. Ideally, a segmentation project should be able to digest and reduce market information to a form that supports fast, accurate decision making (Berrigan & Finkbeiner 1992: 194). The findings should be able to give a clear profile of the customers and point the way for action, e.g., change of the marketing

mix and reallocation of company resources. In other words, the results should be easily translated into actionable marketing strategies.

However, ensuring quality results is no easy task. Perhaps the concepts of *input*, *output* and *control* can be of help in this respect. For example, if we consider a segmentation project as a system, the objectives of the project and the company resources engaged in the project can be thought of as the system *inputs*. The relevant *outputs* are the quality results. Linking the two is the *control* process (Wilson 1979: 76).

Pettinger (1994: 333) contends that the overall function of control involves setting desired standards and measuring actual performance against them. From this, analyses of difference between the two can be made and remedial action can then be taken where necessary. In this respect, documenting the process and reviewing performance can be regarded as control tools. Cameron (1967: 14/49) argues that an effective recording system of the process can help preserve historical data. These data can then be used as the basis for monitoring progress. As for reviewing performance, it is obviously one of the basic steps in a control process (Koontz *et al.* 1980: 722).

Surely, there are many techniques for control, such as budgeting, analysis of break-even points, personal observation, and so on (Koontz *et al.* 1980: 755). While a thorough examination of the control techniques is beyond the scope of the research, a more detailed discussion about control functions can be found in Koontz *et al.* (1980: 743-782).

5.3.2.2 Factor 2: Action on Results

The second factor included variables that were related to "action on results." They were: marketing mix (*product*, *price*, *promotion* and *distribution* decisions) based on results, reallocating resources, continuous monitoring of progress and regularly reviewing market dynamics.

The first factor extracted in the research was *quality results*. While the importance of this is recognised, *quality results* alone cannot guarantee a successful segmentation project. As Berrigan and Finkbeiner (1992: 193) point out, no matter how thorough or informative segmentation analyses appear to be, they must be implemented effectively to achieve the benefits of the approach. So, getting quality results from a segmentation project is in fact a beginning, not an end.

Mahajan and Jain (1978: 339) contend that market segmentation and resource allocation are closely intertwined and cannot be separated. To harvest the fruit from a segmentation project, the research findings should be incorporated into the company's marketing plan, and actions taken toward satisfying target markets' needs should be based on the results from the research. However, this is not an easy job. Taking action involves uncertainty and risk. For various reasons, companies may be hesitant to take action. Management may feel uneasy about exploring a new market. Also, there may be resistance to change from within the company. The consequences are that the company may fail to go on to the subsequent stage of using the results for marketing mix alteration or resource allocation. As the saying goes, *no pain, no gain*: management must have the courage to take action so as to reap from the findings of the segmentation project.

One thing closely related to "action on results" which should be mentioned is the dynamic nature of the market (Beane & Ennis 1987: 38; Mcburnie & Clutterbuck 1988: 139). The marketing environment is constantly evolving. Customers move between market segments, their buying behaviour is not constant in many cases, and these changes must be reckoned with all the time (Eyre 1993: 212). These changes can have important influences on products and services that compete to fulfil the same customer needs. Companies which fail to respond effectively to these changes may lose their market shares and positions (Anderson & Shugan 1991: 219). Market segmentation studies, therefore, should not be thought of as one-shot projects . Instead, the company should continually monitor

the backgrounds of the profitable customers so that appropriate marketing action can be taken should these profiles change over time.

5.3.2.3 Factor 3: Management Support

The third factor included variables related to "management support." Variables included: senior marketing manager involvement, qualified personnel and top management support.

Time and time again, during the pilot interviews, the importance of management support was mentioned. It is almost an axiom that top management support is a necessary condition for the successful development of a segmentation project. So, it is not surprising that the research showed that the degree of top management support is positively associated with segmentation success.

More than two decades ago, Engel *et al.* (1972: 3) argued that, for segmentation to be effective, the commitment of senior marketing management is an absolute must. The reason for this is that attention to previously unrecognised market opportunities will usually require the investment of additional company resources. Often it will demand that the company follows a different direction from that currently being taken. Under these circumstances, unless the segmentation approach is well understood and appreciated by top management, the application of the strategy can have only minimal results.

Comments from some of the respondents might help explain this. One said, "The project wasn't completed due to lack of support from senior management." Another said, "Since the head of the marketing department did not make a long term commitment to the project, nobody perceived it as high priority and very little work was done."

Thus, for a segmentation project to be successful, as a marketing manager suggested during an interview, it seems necessary for top managers to get behind the project at the outset and make clear to all personnel involved that they support

successful completion. In addition, as Weinstein (1987: 208) suggests, a project manager should also work closely with the researchers, planners, analysts, and/or consultants during the project. This will preclude possible misunderstandings at a later date.

One interviewee suggested that top management attention and support could be gained by demonstrating the benefits segmentation can offer through a small scale project, or by education. That is, showing past evidence of what the company can achieve from segmentation research, such as the identification of new markets or new ways to reach customers, better use of media, and so on, can give top management awareness, confidence and interest in segmentation. These beliefs and attitudes, in turn, can provide the segmentation project with the legitimacy it needs to be accepted into the everyday operation of the company.

5.3.2.4 Factor 4: Adequate Project Resources

The fourth factor was named "adequate project resources." Variables included: adequate budget, competitor information, sufficient time and collection of market/customer data. Although the two variables, competitor information and collection of market/customer data, may not initially seem to relate to this factor, presumably they will be the outcome of a segmentation project if adequate project resources have been allocated. Having been allocated with adequate resources, a segmentation project should be able to generate reports which include detailed information about competitors, market and customers.

It is understandable that the success of a segmentation project relies so much on adequate project resources. After all, a project cannot generate results without a company's commitment in terms of manpower, money, time and so on. However, segmentation research can be costly. Weinstein (1987: 56) points out, in designing the research plan for a segmentation analysis, management's primary concern is minimising costs. Inevitably this means that the segmentation project manager is facing a big challenge. As one of the respondents commented,

"Although the marketing manager supported the segmentation project, he had no power to allocate enough resources to the project. The members had to take it on in addition to already very heavy workloads and work on the project in their own time." No wonder in this case the project eventually failed. The project manager had to try hard to execute the task to meet the required quality standards, and to keep time, cost and resources expenditure at a minimum level.

Weinstein (1987: 53-56) suggests that the bottom line is that a company should use whatever source of information can best meet its needs, at a cost it can afford. Segmentation research can either be conducted in-house, through the marketing research department, or contracted out to a commercial marketing research firm or marketing consultant. A project conducted in-house is generally less expensive, since labour and related project expenses can be better controlled. However, there may be occasions when the requisite skills and time are not available in the company. Under these circumstances, turning to consultant companies, research companies, universities, and so on may be necessary. For example, many universities, such as Warwick University, have a research bureau or specialised business centre that can provide advice and technical assistance for such projects. And of course, the marketing faculty can be an excellent source for obtaining consultants specialising in segmentation analysis.

5.3.2.5 Factor 7: Customer Group Selection

The seventh factor included variables related to "customer group selection." They were: evaluating each customer group and selecting customer groups systematically.

Presumably, the end product of a segmentation project is the division of the total market into several relatively homogeneous groups with similar product or service interests (Boone & Kurtz 1987: 126). Now, the company can see the market structure more clearly and will have to select from the alternative market segments one or more groups to focus on. To select customer groups, each of the

individual segments will have to be evaluated on its own merits and in conjunction with the capabilities and business environment of the company (Weinstein: 184).

Although many segments may appear attractive, the company may not have the capabilities to serve all of them. A choice must be made: some segments will be served, others will not (Gross *et al.* 1993: 216). The objective is to pursue the most attractive target market opportunities at the possible expense of less desirable segments (Weinstein: 168-169).

Engel *et al.* (1993: 696-697) suggest that once the market has been divided properly into different segments, the company has three options: (1) concentrated marketing, (2) differentiated marketing, and (3) undifferentiated marketing. In concentrated marketing, the primary focus is on one segment. In differentiated marketing, the company will focus on two or more segments, offering a different marketing mix for each. In undifferentiated marketing, the company may decide that the best policy is to offer a product and marketing mix to all of the segments.

5.3.2.6 Factor 9: Morale and Communication

The ninth factor included variables related to "morale and communication." These included: high morale and internal communication.

Morale, can be defined as the "will to work" (Williams 1967: 11/241). From a project management viewpoint, Meredith and Mantel (1995: 126) contend that performance will be strongest when the morale of project team members is high. So, it is important for a company to ensure that the team members are in high spirits if it is to be successful in a segmentation project.

There have been many studies which look at the theory of motivation. These include Maslow's *hierarchy of basic needs*; McGregor's *theory X* and *theory Y*; Herzberg's *two-factor theory of work motivation*; Ouchi's *theory Z*; and Mayo's *Hawthorne effect* (Eyre 1993: 130-136). For example, Herzberg (1968), who

studied what motivated technical employees such as engineers and scientists on a project team, contends that recognition, achievement, the work itself, responsibility, advancement, and the chance to learn new skills are motivators. In addition, the use of participative management is also a good way of motivating people (Meredith & Mantel 1995: 174). The concept suggests that the individual worker should play a significant role in deciding what means should be employed in meeting desired ends, and in finding betters ways of accomplishing tasks.

From the team work aspect, Eyre (1993: 129) claims that the problems of group motivation are largely the same as those relating to the motivation of individual workers. There are, however, additional factors that must be taken into account: (a) the group must consist of compatible individuals; (b) the group must be of an optimum size; (c) work must be allocated fairly between the members of the group; (d) the group's manager or supervisor must set targets that are reasonable and achievable; (e) the achievements of the group as a whole must be recognised by management and appreciation for these achievements made known to the group; and (f) no individual in the group should be consistently singled out for special treatment as this causes resentment and a diminution of motivation.

The second variable in this factor, communication, is an important issue closely related to morale. Koontz *et al.* (1980: 688) define communication as "the transfer of information from the sender to the receiver with the information being understood by the receiver." Over the years, many authors have recognised the importance of communication in organised effort. Barnard (1938), for example, viewed communication as the means by which people are linked together in an organisation to achieve a common purpose. For an organisation to carry on its activities, effective communication is of vital importance (Eyre 1993: 137). Only by communicating effectively can any activity of any kind be planned, organised and carried through. A segmentation project is no exception. There is a large amount of literature discussing the importance, ways and impact of communication. Although it is beyond the scope of this dissertation to review it

here, a thorough review of communication can be found in Koontz *et al.* (1980: 687-715).

5.3.2.7 Factor 10: Knowledge of the Customer

The tenth factor included variables related to "knowledge of the customer." These included: awareness of customers' needs and the grouping of similar customers.

As Dalrymple and Parsons (1995: 117) explain, "Until customers place orders, nothing really happens. Once customers think enough about your goods or services to buy them, you are in business. Also, when customers stop placing orders, your organisation starts to die." The importance of knowing the customer goes without saying because customers are where the life of a company begins (Dalrymple & Parsons 1995: 117).

When marketing managers really understand their target marketers, they may group customers with similar needs. Then they may see breakthrough opportunities and develop a specific marketing mix to fill the needs of targeted groups. For example, Eastman Kodak - maker of cameras and photographic supplies - also produces an industrial product, X-ray film. After a close study of customers' needs in hospitals and health-care units, Kodak came up with a completely new product for radiologists and captured the whole market successfully (McCarthy & Perreault 1990: 67).

In another example, Gross *et al.* (1993: 362) illustrate how the knowledge of customers' business has earned Laidlaw Transportation a very strong position in a specialised market niche. The company is the largest operator of school buses and special education vehicles in North America, with more than 13,000 vehicles in service. While seemingly a mundane, mature business, it is consistently highly profitable for the company. By focusing on a niche like the education industry, Laidlaw has developed an excellent understanding of the needs of school boards

and how decisions are made in these organisations. Thus Laidlaw is able to put together customised packages that meet the specific needs of a particular board.

5.3.3 Factors without Significant Success Differences

Apart from the aforementioned seven CSFs, there were three factors which showed no significant difference between the *lower-half* and *upper-half* groups. They were: SWOT analysis, formality of the segmentation project and the use of statistical packages.

These three factors, together with the seven critical success factors discussed in section 5.3.3.2, were generated by reviewing the literature and by pilot interviews in the *first* phase of the research. For these three factors, not having significant differences between the *lower-half* and *upper-half* groups in the *second* phase analysis, however, does not necessarily mean they are unimportant. In order to try and explore the underlying reasons, validating interviews, the *third* phase of the research, were conducted with some practitioners.

Possibilities for the lack of a significant difference for these factors are as follows. *First*, these factors may be not important to the success of a segmentation project. *Secondly*, they may be less important than the other seven factors. *Thirdly*, questions asked relating to these factors might not be refined adequately so that the research was unable to probe the nature of these factors in enough detail and hence was unable to demonstrate their role in segmentation implementation. *Lastly*, the research was not able to show their importance due to sampling bias.

During the validating interviews, it was agreed by the majority of the interviewees that these three factors: SWOT analysis, formality of the segmentation project and the use of statistical packages are important but that both the *lower-half* and *upper-half* groups may not be particularly skilled in these areas. For this reason, these three factors failed to show significant differences between

the two groups. It was agreed by most of the marketing people interviewed that, to this day, the three factors are still not widely addressed in the business world, or at least in the segmentation studies. In spite of the fact that these three factors showed no significant differences between the two groups they will still be discussed in this section.

5.3.3.1 Factor 5: SWOT Analysis

The fifth factor included variables related to "SWOT analysis." They were analysing opportunities and threats, analysing strength and weakness, and evident company capability.

According to Gross *et al.* (1993: 250), any company must establish its competitive strategy by examining two distinct environments: its own and that of the external world. Such analysis is often referred to by the acronym SWOT. The first two letters refer to the *strengths* and *weaknesses* of the company. That is, the company has to examine its core competencies and the shortcomings in terms of managerial talent, resources, market knowledge, and so on. The last two letters of the acronym refer to *opportunities* and *threats* in the external environment. That is, the company must examine important environmental influences such as technology, new marketing channels, government policies, the economy, and so on, to see if they pose any potential opportunities or threats to the company.

The importance of SWOT analysis is consistently cited as a component of any marketing plan (e.g. Dibb *et al.* 1994: 569-571). McDonald (1989a: 248) argues that SWOT analysis should be completed for each segment and suggests that the analysis, if well done, would help to identify and pin down the real issues which should be addressed as a matter of priority. While SWOT analysis may be commonly adopted in the business world, little research has addressed the importance of quality SWOT analysis. This was aptly illustrated by one respondent from a company where the segmentation study had failed who blamed

a "lack of realism about SWOT analysis issues" for the failure to complete and implement his company's segmentation project.

Evident company capability is closely related to SWOT analysis since it is through this kind of analysis that a company's capability can be understood. Speed and Smith (1992: 381) claim that if segmentation research takes more account of the capabilities of companies when identifying segments, then the resulting strategies are likely to be more successful. A comment from one of the respondents that "The segmentation project failed due to unrealistic assessment of company capability" (See Table 5-22) seems to demonstrate the importance of capability analysis.

5.3.3.2 Factor 6: Formality

The sixth factor comprised three variables related to "formality." These included: consensus on objectives, clear objectives and formal procedures.

A company must have specific goals in order to use all of its resources in the most effective way. These goals are the objectives of the company, the end-results that must be achieved (Eyre 1993: 24). Generally speaking, objectives offer three functions (Boone & Kurtz 1987: 148). *First*, by specifying an end goal for the organisation, objectives direct the efforts of managers in its pursuit. *Secondly*, objectives offer concrete benchmarks for evaluating organisational performance. Without such standards, the manager possesses no tools for evaluating performance. *Finally*, objectives perform a motivational role in encouraging managers and operative workers to contribute their best efforts.

However, setting clear objectives is not always easy. According to one respondent, "It was difficult to set objectives for the segmentation project." Nor is it easy to get consensus on objectives, as another respondent commented, "The segmentation project was not completed because there was no company consensus about the objective and benefit of segmentation."

Massie (1979: 34) contends that individuals within a company have their own personal ideas of what results they want to achieve. Furthermore, the needs of individuals are important as bases for their motivation. People will cooperate as long as the goals of the company are consistent with their ideas of their own goals. Therefore, a company must maintain a set of objectives that is common to the members of the group.

5.3.3.3 Factor 8: The Use of Statistical Packages

The eighth factor included variables related to "the use of statistical packages." They were: using statistical packages, customers' opinion survey and dividing customers using different methods.

The advent of more sophisticated statistical techniques and the increase in their general availability through computer packages[1] during recent years has led to what Sheth (1971) described as a "multivariate revolution" in marketing. Doyle and Saunders (1985: 32) claim that managers in industrial companies appear to be much more capable of appreciating fairly advanced statistical and computer based techniques than their colleagues in consumer goods businesses whose technical education is generally much weaker. However, little empirical evidence supports their argument. Whether industrial marketers are more capable of appreciating advanced statistical techniques than marketers in consumer businesses is still open to debate. Findings from this research (see Table 5-14, where "using statistical packages" has the lowest mean score amongst the 31 segmentation activities) indicate that the adoption of statistical techniques in industrial markets may not be as popular as many people thought. This is consistent with Hooley (1980: 379), who argues that marketing practitioners seem less ready than academics to join in the "revolution" and to take advantage of the new techniques available.

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[1] For a comprehensive survey of the available software packages see Hirst (1991a & 1991b).

Weinstein (1987: 207) argues that traditional approaches to market segmentation often emphasise theoretical methods and multivariate analysis. The end result of such a study is a complex segmentation model understood only by the researcher - and seldom utilised by management. This is, perhaps, one of the reasons why statistical packages are not widely used by practitioners. Indeed, market research is highly statistical and requires expert knowledge and experience if it is to be at all reliable (Eyre 1993: 210). The successful use of statistical techniques depends on reliable data and the ability of personnel and management to use them correctly (Evans & Berman 1988: 148). Therefore, it is advisable to consult with experts to assist in research design, obtaining data, interpreting the findings, and strategy development where necessary (Weinstein: 209).

A variety of statistical methods is available to help segmentation research, such as: factor analysis, cluster analysis, multidimensional scaling, conjoint measurement, automatic interaction detector, multiple regression and discriminant analysis, canonical analysis, and so on (Weinstein 1987: 59-61). A few of these techniques have been discussed in Chapter Three of the thesis. While a comprehensive review of these techniques is beyond the scope of the research, the interested reader should consult advanced marketing research or statistics texts for further information on multivariate statistical techniques (e.g., Churchill 1991; Everitt & Dunn 1991; Green *et al.* 1988; Seber 1984; Tabachnick & Fidell 1989; Tull & Stanley 1993).

5.3.4 The Impact of Each Activity

In sections 5.3.1 to 5.3.3, the impact of each factor on segmentation success was investigated. The adoption of factor scores, instead of the score of each segmentation activity, made it easier to explain the variance in the segmentation success as a function of a much smaller set of underlying dimensions. However, the impact of each activity is still being considered in this section for two reasons.

First, the examination of the impact of each activity can be used to compare with the results obtained from the analysis of factor scores and hence validate the approach of using factor scores in this research. The examination of each activity score should produce much similar results, if the ten factors extracted are satisfactory surrogate measures of the 31 activities. *Secondly*, the ten factors explain only 76.7% of the variance in the data set. It would be interesting to check where the remaining 23.3% variance lies. The investigation of each activity score may provide the answer.

Using the mean value of each activity as the cut-off point, the 86 cases were separated into two groups: *lower-half* and *upper-half*. *Student's t* tests were then performed to examine if differences existed between the two groups. Table 5-24 shows that, in 23 out of the 31 activities (74.2%), the differences between the two groups were significant at the 5% level, and in 21 out of the 31 activities (67.8%) the differences were highly significant at the 1% level. These results are very similar to the outcome from the analysing of factor scores where differences existed in 7 out of 10 factors.

Table 5-24 Segmentation Success Scores (of Each Activity)

Factor	Activities	Lower Half	Upper Half	Mean Difference	Significance Level
1. Quality results	31. documenting the process	3.21	4.05	0.84	0.00 **
	30. reviewing performance	3.11	4.18	1.07	0.00 **
	24. easily transformed results	2.96	4.02	1.06	0.00 **
	22. clear customer profile	3.16	4.05	0.89	0.00 **
	23. knowing how to compete	3.21	4.05	0.84	0.00 **
2. Action on results	26. marketing mix based on results	3.16	4.00	0.84	0.00 **
	25. reallocating resources	3.29	4.17	0.89	0.00 **
	27. continuous monitoring of progress	3.33	4.00	0.67	0.00 **
	29. regularly reviewing market dynamics	3.37	4.13	0.76	0.00 **
3. Management support	5. senior marketing manager involvement	3.09	3.91	0.82	0.00 **
	4. qualified personnel	3.14	3.86	0.71	0.00 **
	6. top management support	2.96	4.00	1.04	0.00 **
4. Adequate project resources	9. adequate budget	3.38	4.03	0.65	0.00 **
	12. competitor information	3.49	3.94	0.46	0.05 *
	10. sufficient time	3.44	4.06	0.62	0.01 **
	11. collection of market/customer data	3.36	3.86	0.50	0.04 *
5. SWOT analysis	19. analysing opportunities & threats	3.20	3.89	0.69	0.01 **
	20. analysing strength & weakness	3.55	3.72	0.18	0.48
	21. evident company capability	3.12	3.83	0.71	0.01 **
6. Formality	3. consensus on objectives	3.40	3.97	0.57	0.02 *
	2. clear objectives	3.46	3.89	0.43	0.06
	1. formal procedures	3.83	3.56	-0.27	0.24
7. Customer group selection	17. evaluating each customer group	3.41	3.81	0.40	0.09
	18. selecting customer groups systematically	3.50	3.88	0.38	0.08
8. Use of statistical package	13. using statistical packages	3.43	4.03	0.61	0.01 **
	28. customers' opinion survey	3.53	3.84	0.31	0.16
	15. dividing customers using different methods	3.41	4.00	0.59	0.01 **
9. Morale and communication	8. morale	3.04	4.02	0.98	0.00 **
	7. internal communication	3.15	3.96	0.81	0.00 **
10. Knowledge of customer	14. awareness of customers' needs	3.28	3.87	0.59	0.01 **
	16. grouping similar customers together	3.55	3.81	0.26	0.29

* Significant at the 95% level
** Significant at the 99% level

However, a second look at Table 5-24 shows that, when compared with the results from Table 5-23, three factors (the shaded area) gave inconsistent results. In Table 5-23, factors 5 and 8 showed no difference between the *lower-half* and

upper-half groups, and factor 7 showed significant difference between the two groups. In Table 5-24, the results were completely different for the three factors

Possible reasons for this inconsistency might be that, *first*, the assignment of cases to the *lower-half* and *upper-half* groups for the two approaches (using factor scores and using activity scores) is not necessarily the same. Taking the first factor, quality results, for example, the *lower-half* group had 33 cases and *upper-half* had 53 cases. When examining each variable of factor one (variables 31, 30, 24, 22 and 23), a cross tabulation showed the two approaches produced classifications with about 70-85% similarity, rather than 100% similarity.

Table 5-25 Confusion Matrix of Classification (by Factor and by Activity)

	Q26-(31)		Q26-(30)		Q26-(24)		Q26-(22)		Q26-(23)	
Factor 1	Lower half	Upper half	Lower half	Upper half	Lower half	Upper half	Lower half	Upper half	Lower half	Upper half
Lower half	30	3	31	2	22	11	23	9	26	7
Upper half	13	38	11	40	7	43	13	37	14	36
C.C.R.*	68/84** = 81.0%		71/84 = 84.5%		65/83 = 78.3%		60/82 = 73.2%		62/83 = 74.7%	

* C.C.R.: correct classification rate

** Total sample size is not the same along the five variables owing to missing values

A *second* reason might be that some information was missing during the transformation of 31 variables to 10 factors. After all, the 10 factors explained only 76.7% of the total variance, as indicated in Table 5-16. *Lastly*, as Norusis (1994: 7) suggested, univariate tests of significance (results shown in Table 5-24) provide basic information about the distributions of the variables in the groups and help to identify some differences amongst the groups. However, in multivariate statistics (results shown in Table 5-23), the emphasis is on analysing the variables together, not one at a time. By considering the variables simultaneously, additional information about their relationships is incorporated.

5.4 Summary

This chapter has summarised and discussed general findings from the research. These findings include:

- Empirical evidence from this study supports the arguments of Bonoma and Shapiro (1983: 1-2), in terms of segmentation objectives.
- For segmentation usefulness, "nobody in the company knows what segmentation is about" is perhaps the most important reason that hinders the adoption of segmentation concept in the business world.
- Findings from the research also show that segmentation concepts may not be as well understood and widely adopted by practitioners as most people would have thought. Only 50.7% of the companies surveyed have ever conducted a market study containing a segmentation project, and only 32% of the respondents have been involved in a segmentation study.
- As far as the main purpose for the segmentation related study is concerned, most (46.7%) were conducted to understand market situations.
- This study also shows that segmentation is adopted by practitioners for products in all of the four different stages of product life cycle, but mostly, in the *very new* (20.5%), *young* (29.5%) and *mature* (39.7%) stages. Only 5.1% of the segmentation projects were conducted for *ageing* products.
- Regarding the 31 segmentation activities, ten factors believed to impact upon segmentation success were extracted and were used for the analysis of hypotheses testing.
- Also discussed in this chapter were the difficult elements in a segmentation project. These difficulties include: formality of the segmentation procedures, management support, morale of the project members, consensus and politics within the company and the project team, limited resources, lack of segmentation knowledge, inability to get reliable data and to analyse the data properly, lack of action on the results, and inability to assess the segmentation success.

- Regarding the *segmenting*, *targeting* and *positioning* stages, it seems that the majority of the companies surveyed did not do well in the *positioning* stage.
- Though not based on real financial data, the research found that the correlation coefficient between segmentation success and sales success is 0.61, indicating that there is a highly positive relationship between the two success measures.
- In section 5.3, the impact of the ten factors was examined. Seven out of the ten factors showed significant differences between the *lower-half* and *upper-half* of the samples, and were considered as CSFs in a segmentation project. These seven factors, together with the three factors which showed no significant differences between the *lower-half* and *upper-half* groups, were further discussed as to their relationships with segmentation success.
- Finally, the impact of the 31 segmentation activities was examined. The investigation of both the factor scores and the score of each activity produced very similar results. The use of both approaches has two benefits for the research. On one hand, it enabled the researcher to take advantage of the simplicity of using the ten factors as surrogate measures of the 31 segmentation activities. On the other hand, the similarity of the results from the two approaches gave the researcher the confidence to use the results from factor analysis for the further investigations in Chapter Six.

6. Further Investigation

6.1 A Reverse Check
6.2 The Application of Cluster Analysis
6.3 A Double Check of the Three Stages
6.4 The ***PFA*** Market Segmentation Model
6.5 Summary

In Chapter Five, ten factors were extracted from the 31 segmentation activities, and seven of them were considered as CSFs for segmentation success. In this chapter, the research goes a step further to examine the differences between *unsuccessful* and *successful* groups. This examination leads to the identification of three stages in the market segmentation process. They are the *plan*, *fieldwork* and *action* stages. Using these stages, the 86 cases are clustered into different groups and the characteristics of each group checked. Based on the findings from these procedures, a *plan*, *fieldwork, action* (***PFA***) model is developed. The model can be used to assess the success rate of a market segmentation project.

6.1 A Reverse Check

> *"Identifying these KSFs* [CSFs] *is not always easy. ...* [One approach] *is to discover what distinguishes winner companies from losers, and then to analyze the differences between them."*
>
> *(Ohmae 1982: 42)*

In the previous chapter, the 86 responses from the questionnaire survey were divided into the *lower-half* and *upper-half* groups, based on their scores in each of the ten success factors. Significant differences were found between the two groups in seven out of the ten factors. These seven factors were termed *critical success factors* because the success of a segmentation project seems particularly to rely upon them.

Such an approach, however, tells only half of the story because "success" can be treated as either a dependent variable (as shown in Chapter Five) or an independent variable (as will be discussed in this chapter). Given general knowledge of logic, the truth of *if p then q*[1] does not necessarily mean that *if q then p* is also true. Similarly, if the *upper-half* group of a specific factor achieves a higher segmentation success score it does not necessarily mean that a more successful project will achieve a higher score in that specific factor. Therefore, a reverse check, using *success* as an independent variable, is considered important in getting a deeper understanding of the factors that are critical to segmentation success.

As Ohmae (1982: 42) suggests, the 86 responses can be divided into *unsuccessful* and *successful* groups. The characteristics of each group can then be examined by testing if significant differences exist between the two groups in terms of the identified ten factors. By doing so, factors exclusive to successful projects can then be identified.

6.1.1 Unsuccessful versus Successful Projects

To conduct the reverse check, the responses with low success scores (1, 2 & 3) were classified as *unsuccessful* projects and those with high success scores (4 & 5) were classified as *successful* projects. *Student's t* tests were then used to determine whether successful projects were predominantly those which had high factor scores (see section 3.5.1.4 for the computation of factor scores). Table 6-1 shows that in all factors the average score is higher for the successful projects than for the unsuccessful ones. In five out of the ten factors the differences were

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[1] The implication of *if p then q* is that for *q* to be true it *suffices* that *p* be true. Or, *p* is a ***sufficient*** condition for *q*. It also says that in order for *p* to be true, it is *necessary* that *q* be true (though perhaps not sufficient!). So, *q* is a ***necessary*** condition for *p* (Devlin 1981: 11-12).

statistically significant, one (factor 5) at the 95% level and the other four (factors 1, 2, 3 & 9) at the 99% level.

Table 6-1 Comparison of Unsuccessful & Successful Projects by Factor Scores

Factor	Activities in Q26 (see Table 5-16 for keys)	Unsuccessful Segmentation n=31	Successful Segmentation n=48	Mean Difference	Significance Level
1. Quality results	31, 30, 24, 22, 23	-0.59	0.47	1.06	0.00 **
2. Action on results	26,25,27,29	-0.40	0.31	0.71	0.00 **
3. Management support	5, 4, 6	-0.42	0.22	0.65	0.00 **
4. Adequate project resources	9, 12, 10, 11	-0.05	0.13	0.18	0.49
5. SWOT analysis	19, 20, 21	-0.26	0.23	0.49	0.05 *
6. Formality	3, 2, 1	-0.05	0.00	0.05	0.84
7. Customer group selection	17, 18	-0.04	0.00	0.05	0.84
8. The use of statistical packages	13, 28, 15	-0.09	0.05	0.14	0.53
9. Morale and communication	8, 7	-0.38	0.30	0.67	0.01 **
10. Knowledge of the customer	14, 16	-0.07	0.06	0.12	0.59

* Significant at the 95% level
** Significant at the 99% level

Table 6-2 combines the results from Table 5-23 and those from Table 6-1. Factors 1, 2, 3 and 9 appeared to be both *sufficient* and *necessary* conditions for segmentation success. Factors 4, 7 and 10 appeared to be *sufficient* but not *necessary* conditions for segmentation success. Factor 5 was awkward. It was not a *sufficient* condition and yet a *necessary* condition for segmentation success. In this research the difference of factor 5 between the two groups was treated as insignificant for two reasons. *First*, similarly to the reasoning given in section 5.3.4 (Table 5-25), the cases assigned to the *lower-half* and *upper-half* groups of the factors are not necessary exactly the same as those assigned to the unsuccessful and successful groups. This may result in a conclusion which is hard to explain. The *second* reason is that, by adopting a *weighted-mean method*, this research finds that there is no significant difference between the *lower-half* and *upper-half* groups, if factors 4, 5, 7, 8 and 10 are treated together. This point will be further explained in section 6.3.1, as it is closely related to the model building of the research.

Table 6-2 Critical Success Factors & Segmentation Success

Factor	Activities in Q26 (see Table 5-16 for keys)	Factors as ID. V. (*sufficient*)	Factors as D. V. (*necessary*)
1. Quality results	31, 30, 24, 22, 23	0.00 **	0.00 **
2. Action on results	26,25,27,29	0.00 **	0.00 **
3. Management support	5, 4, 6	0.00 **	0.00 **
4. Adequate project resources	9, 12, 10, 11	0.00 **	0.49
5. SWOT analysis	19, 20, 21	0.10	0.05 *
6. Formality	3, 2, 1	0.73	0.84
7. Customer group selection	17, 18	0.00 **	0.84
8. The use of statistical packages	13, 28, 15	0.56	0.53
9. Morale and communication	8, 7	0.00 **	0.01 **
10. Knowledge of the customer	14, 16	0.02 *	0.59

ID. V: Independent Variable
D. V: Dependent Variable
* Significant at the 95% level
** Significant at the 99% level

The reverse check adopted here has identified four factors, out of the seven CSFs, which are possessed exclusively by successful segmentation projects. They are factor 1: *quality results*, factor 2: *action on results*, factor 3: *management support* and factor 9: *morale and communication.* They are both *sufficient* and *necessary* conditions for segmentation success. The implications of this finding will be further discussed in section 7.3.1.

6.1.2 Main Stages in a Segmentation Project

To examine thoroughly the effects that the ten factors have on the successful implementation of a segmentation project, the factors were put into chronological order as shown in Table 6-3. The reason for doing this was that the 31 activities in Q.26 of the questionnaire had anyway been arranged in chronological order. For example, the first activity in Q.26, "*formal and agreed procedures were used for conducting the segmentation project*" was considered to be a prerequisite of the second activity in Q.26, "*the project objectives were clearly defined*". Using factor analysis, ten factors were extracted from the 31 segmentation activities. During the investigation of the ten extracted factors, it was found that, in general, each of the ten factors contained activities with sequence numbers close to one

another. For example, activities 1, 2 and 3 of Q.26 were found to be included in factor 6, *Formality*. Activities 4, 5 and 6 of Q.26 were grouped as factor 3, *Management support*. The researchers (Lin & Dibb 1994) had already wondered whether a simpler scheme for classifying the factors may emerge.

> *"For the many constituents of KSFs* [CSFs] *for ensuring segmentation success, it is possible to construct a multi-dimension* [sic] *scheme into which the factors can be fitted. The scheme may be of great help in condensing KSFs so that they will be concise, understandable, and hence, easy for practitioners to adopt in their search for segmentation success."*
>
> *(Lin & Dibb 1994: 7)*

As a result of the work it was interesting to discover that three stages, namely, ***plan***, ***fieldwork*** and ***action***, emerged from the rearrangement of the ten factors. The naming of the three stages was not arbitrary. An investigation into the factors and the activities they contained revealed that, in general, activities 1 to 8 were related to *planning*, 9 to 21 were associated with *fieldworking*, and 22 to 31 were related to *actioning*. The naming was a good reflection of the logical grouping of the factors identified. Later, it was found that the grouping of the factors into the three stages clarified the discussion of the importance of the factors.

Table 6-3 Segmentation Success Scores (Factors in Chronological Order)

Factor	Activities in Q26 (see Table 5-16 for keys)	Factors as ID. V. (*sufficient*)	Factors as D. V. (*necessary*)
***Plan*:**			
6. Formality[2]	1, 2, 3	0.73	0.84
3. Management support	4, 5, 6	0.00 **	0.00 **
9. Morale and communication	7, 8	0.00 **	0.01 **
***Fieldwork*:**			
4. Adequate project resources	9, 10, 11, 12	0.00 **	0.49
8. The use of statistical packages	13, 15, 28	0.56	0.53
10. Knowledge of the customer	14, 16	0.02 *	0.59
7. Customer group selection	17, 18	0.00 **	0.84
5. SWOT analysis	19, 20, 21	0.10	0.05
***Action*:**			
1. Quality results	22, 23, 24, 30, 31	0.00 **	0.00 **
2. Action on results	25,26,27,29	0.00 **	0.00 **

ID. V: Independent Variable
D. V: Dependent Variable
* Significant at the 95% level
** Significant at the 99% level
Shaded: Treated as insignificant difference, the reason being explained in section 6.1.1

A quick look at Table 6-3 shows that *plan* and *action* seem to be both *sufficient* and *necessary* conditions for segmentation success, while *fieldwork* seems to be a *sufficient* but not *necessary* condition for segmentation success. Factors in each of the three stages were then used as entry variables for clustering the 86 cases into different groups so as to investigate further the nature of the three stages.

6.2 The Application of Cluster Analysis

Anderberg (1973:22) argues that any given data set may be classified in different but meaningful ways. He suggests that new insights and understanding

[2] Factor 6, *formality*, was found to be neither a *sufficient* nor a *necessary* condition for segmentation success. One of the reasons may be that *formality* is less important than other factors. But more likely, both *successful* and *unsuccessful* companies may not be skilled in setting clear segmentation objectives, reaching consensus on objectives and establishing formal procedures for segmentation implementation.

might result from alternative classifications generated by cluster analysis and totally unexpected aspects of structure might be revealed in the process. Ideally, the set of clusters generated by a cluster analysis procedure will produce combinations of entities which otherwise might never be considered for examination. Therefore, cluster analysis was employed to explore the nature of the *data structure* of the 86 cases in the research.

6.2.1 Clustering the Cases

As discussed in section 3.5.2.1, for any given classification problem there are many variables which could be used to classify cases into different groups. The choice of variables is highly subjective, based on individual researcher's beliefs of the issues most relevant to the specific application. Although it is possible to use large numbers of variables, it is important to guard against what Aldenderfer and Blashfield (1984: 20) described as a form of *naive empiricism*, which is defined as:

> *"... the collection and subsequent analysis of as many variables as possible in the hope that the 'structure' will emerge if only enough data are obtained."*

Such an approach is dangerous as it may lead to confusion about which variables are of the greatest relevance to the application (Everitt 1980). Therefore, it is necessary to choose a finite subset of variables which leads to clear classification results. In this research, three sets of variables, originating from the *plan*, *fieldwork* and *action* stages respectively, were selected.

Cluster analysis was applied three times to group the 86 fully completed cases. Factors 6, 3 and 9, which were related to the *plan* stage, were the *first* input variables for the analysis. Using Ward's hierarchical method and Euclidean distance, the analysis produced two clusters, with sample sizes 41 and 45 respectively. *Secondly*, factors related to the *fieldwork* stage, including 4, 8, 10, 7 and 5, were used as input variables, and resulted in two clusters, with sample sizes of 42 and 44. *Lastly*, factors 1 and 2, which were related to the *action* stage, were

used and also generated two clusters, with sample sizes of 62 and 24. It was not by chance that all of the three cluster analyses produced two clusters each. Figures 6-1 to 6-3 all show a large change in the dendrogram level in going from 2 to 1 clusters, which means that 2 was an appropriate cluster level to select.

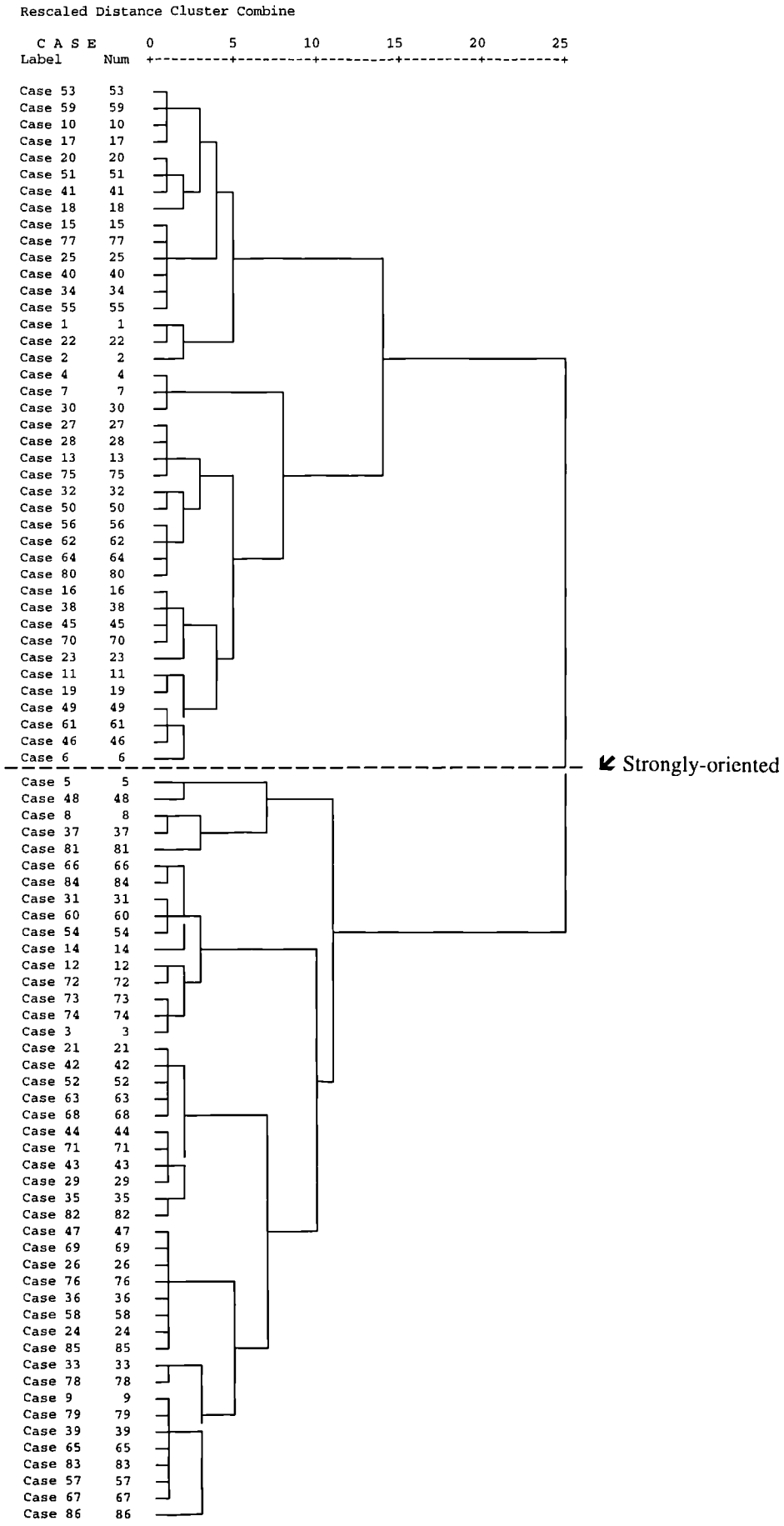


Figure 6-1 Dendrogram (Using *Plan* Stage Variables)

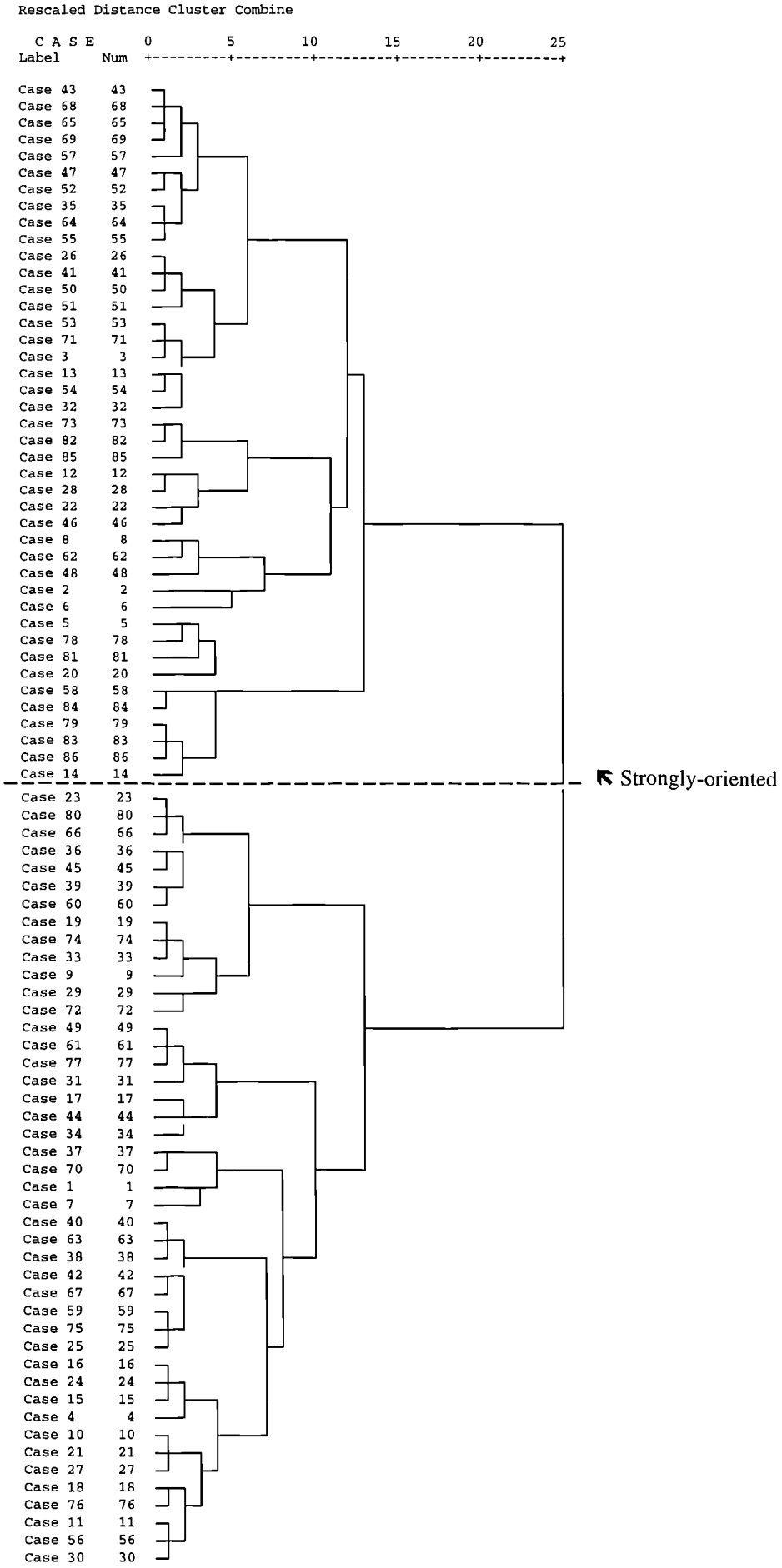


Figure 6-2 Dendrogram (Using *Fieldwork* Stage Variables)

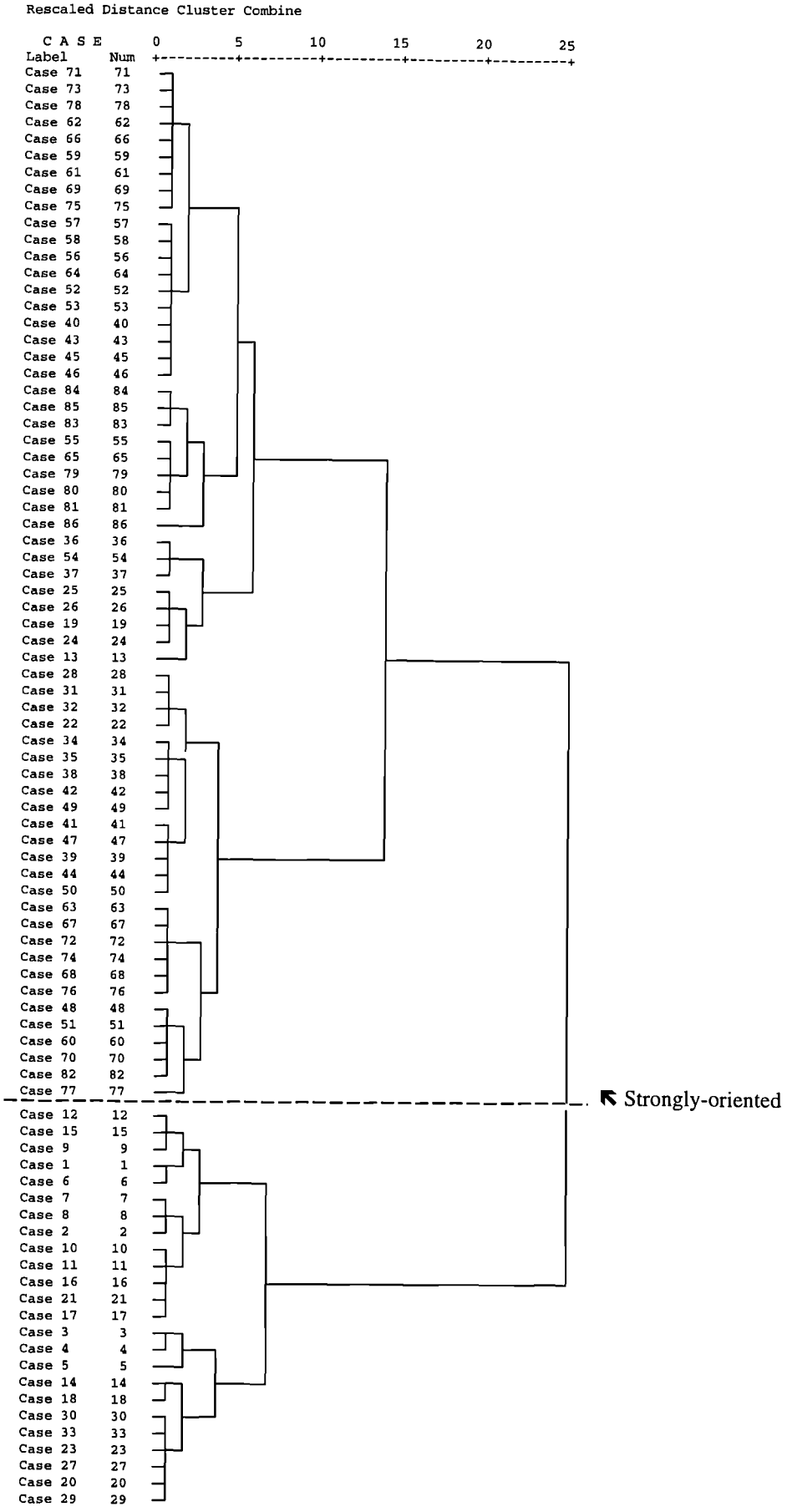


Figure 6-3 Dendrogram (Using *Action* Stage Variables)

The two groups in each of the clustering procedures for each stage were then named *weakly-oriented* and *strongly-oriented.* The naming was based on an examination of the characteristics of each cluster which is explained in section 6.2.2.1.

6.2.2 Validating Cluster Results

As discussed in section 3.5.2.5, it is necessary to validate the results obtained from cluster analysis. This is especially important in this research because the results from the cluster analysis were then used as a foundation for developing a model for assessing segmentation success. To validate the cluster results, three methods were used. These were: significance tests, split-half, and discriminant analysis.

6.2.2.1 Significance Tests

Student's t tests were used to detect differences in the means of factor scores for clusters. The validation results are satisfactory as Tables 6-4 to 6-6 show that significant differences do exist between each pair of clusters identified in the three cluster analyses. A closer look at the three tables shows that they all have one cluster which has negative factor scores along all the factors and another cluster with positive scores along all the factors. Although the significant test in itself is no surprise as this is what cluster analysis is meant to be, it is interesting to find out the consistent negative and positive signs in each pair of the groups. This finding implies that the data gathered in this research have a clear underlying structure (Everitt 1974: 66).

Therefore, based on the signs of the factor scores, the two clusters identified by the *plan* factors were named *plan weakly-oriented*, denoted as $\boldsymbol{P_w}$, and *plan strongly-oriented*, denoted as $\boldsymbol{P_s}$. Similarly, the clusters identified by the *fieldwork* factors were named *fieldwork weakly-oriented*, denoted as $\boldsymbol{F_w}$, and *fieldwork*

strongly-oriented, denoted as F_s. In the *action* stage, the two clusters were *action weakly-oriented*, denoted as A_w, and *action strongly-oriented*, denoted as A_s. The mean factor scores of the clusters in the *plan*, *fieldwork* and *action* stages showed significant differences between the *weakly-oriented* and *strongly-oriented* groups (factor 10 at 95% significant level and all others at 99% level). These results assured the validity of using cluster analysis in dividing the cases in the research.

Table 6-4 Clusters by *Plan* Variables

Stage: ***Plan***	P_w (n=41)	P_s (n=45)	Mean Difference	Significance Level
6. Formality	-0.47	0.43	0.90	0.00 **
3. Management support	-0.45	0.41	0.85	0.00 **
9. Morale and communication	-0.69	0.63	1.31	0.00 **

** Significant at the 99% level

Table 6-5 Clusters by *Fieldwork* Variables

Stage: ***Fieldwork***	F_w (n=44)	F_s (n=42)	Mean Difference	Significance Level
4. Adequate project resources	-0.36	0.38	0.74	0.00 **
8. The use of statistical packages	-0.64	0.67	1.31	0.00 **
10. Knowledge of the customer	-0.23	0.24	0.47	0.03 *
7. Customer group selection	-0.26	0.27	0.53	0.01 **
5. SWOT analysis	-0.39	0.41	0.80	0.00 **

* Significant at the 95% level
** Significant at the 99% level

Table 6-6 Clusters by *Action* Variables

Stage: ***Action***	A_w (n=24)	A_s (n=62)	Mean Difference	Significance Level
1. Quality results	-1.22	0.47	1.69	0.00 **
2. Action on results	-0.82	0.32	1.13	0.00 **

** Significant at the 99% level

6.2.2.2 Split-Half Analysis

The second validation used split-half analysis. This method is popularly used by academics (e.g., Calantone & Cooper 1981: 53; Fader & Lodish 1990: 58;

Hooley *et al.* 1990: 11). The 86 cases were first randomly split into halves, one called the *analysis* sample and the other the *hold-out* sample (Saunders 1994: 23). Then for each half, a discriminant function to explain cluster membership was developed, with the factor scores as the function variables. Each discriminant function was tested with new data from the *hold-out* sample. The results in Table 6-7 and Table 6-8 show very high correct classification rates, indicating high validity of the cluster results in this research.

Table 6-7 Classification Results for the *Analysis* Samples

Stage	Actual Group	Predicted Group		Correct Classification Rate (%)
		Weakly-oriented	Strongly-oriented	
Plan	P_w (n=20)	19	1	
	P_s (n=23)	2	21	93.0
Fieldwork	F_w (n=20)	19	1	
	F_s (n=23)	4	19	88.4
Action	A_w (n=6)	6	0	
	A_s (n=37)	1	36	97.7

Shaded areas show correctly classified cases

Table 6-8 Classification Results for the *Hold-Out* Samples

Stage	Actual Group	Predicted Group		Correct Classification Rate (%)
		Weakly-oriented	Strongly-oriented	
Plan	P_w (n=21)	18	3	
	P_s (n=22)	0	22	93.0
Fieldwork	F_w (n=24)	22	2	
	F_s (n=19)	1	18	93.0
Action	A_w (n=18)	18	0	
	A_s (n=25)	2	23	95.4

Shaded areas show correctly classified cases

6.2.2.3 Confusion Matrix

As discussed in section 3.5.3.4, the confusion matrix shows the numbers of correct and incorrect classifications and can be used to validate the results from cluster analysis. This is a method popularly used by academics (e.g., Kim & Lim 1988: 815-816).

Table 6-9 is the summary of the classification results. The diagonal elements are the number of cases classified correctly. In the case of the *plan* cluster, 40 out of the 41 *plan weakly-oriented* cases were classified correctly. Only one is mis-classified as *plan strongly-oriented.* The overall percentage of cases classified correctly is the sum of the number of cases classified correctly in each group divided by the total number of cases. In the *plan* example, 82 out of 86 cases (95.4%) were correctly classified into their original clusters. In the *fieldwork* and *action* stages, the correct classification rates were 90.7% and 98.8% respectively. The high correct classification rates of the three stages suggest that the results from cluster analysis in the study have a high degree of validity.

Table 6-9 Confusion Matrix of Cluster Analysis

Stage	Actual Group	Predicted Group		Correct Classification Rate (%)
		Weakly-oriented	Strongly-oriented	
Plan	P_w (n=41)	40	1	
	P_s (n=45)	3	42	95.4
Fieldwork	F_w (n=44)	41	3	
	F_s (n=42)	5	37	90.7
Action	A_w (n=24)	24	0	
	A_s (n=62)	1	61	98.8

Shaded areas show correctly classified cases

6.2.3 Characteristics of Different Clusters

This section explores the characteristics of each cluster identified in the *plan*, *fieldwork* and *action* stages. Table 6-10 shows that companies which were *plan strongly-oriented* (P_s) tended to evaluate and select customer groups systematically (Factor 7). For other factors in the *fieldwork* stage, no significant differences exist between P_w and P_s groups. In addition, P_s companies tended to have better quality results (Factor 1) and enjoy greater segmentation success.

Table 6-10 Characteristics of Different Clusters (By *Plan*)

	P_w (n=41)	P_s (n=45)	Mean Difference	Significance Level
***Plan*:** (see Table 6-4)				
***Fieldwork*:**				
4. Adequate project resources	-0.11	0.10	0.21	0.33
8. The use of statistical packages	-0.10	0.09	0.19	0.37
10. Knowledge of the customer	-0.20	0.18	0.38	0.08
7. Customer group selection	-0.25	0.23	0.49	0.02 *
5. SWOT analysis	-0.13	0.12	0.25	0.24
***Action*:**				
1. Quality results	-0.31	0.28	0.59	0.01 **
2. Action on results	-0.10	0.09	0.20	0.36
Q.31 Segmentation success	3.21	4.10	0.89	0.00 **
Q.32 Sales success	3.59	3.97	0.38	0.09

* Significant at the 95% level
** Significant at the 99% level

Table 6-11 shows that, compared with F_w cluster, F_s companies tended to have higher management support and have better morale and communication. The two clusters did not show significant differences in the *action* stage, indicating that *fieldwork* strong-orientation did not necessarily lead to *action* strong-orientation. However, Table 6-11 shows that F_s had considerable impact on segmentation success.

Table 6-11 Characteristics of Different Clusters (By *Fieldwork*)

	F_w (n=44)	F_s (n=42)	Mean Difference	Significance Level
***Plan*:**				
6. Formality	-0.13	0.13	0.26	0.23
3. Management support	-0.25	0.26	0.51	0.02 *
9. Morale and communication	-0.22	0.23	0.45	0.04 *
***Fieldwork*:** (see Table 6-5)				
***Action*:**				
1. Quality results	-0.14	0.15	0.29	0.19
2. Action on results	-0.13	0.13	0.26	0.23
Q.31 Segmentation success	3.38	3.95	0.57	0.01 **
Q.32 Sales success	3.61	4.00	0.39	0.08

* Significant at the 95% level
** Significant at the 99% level

Table 6-12 shows that companies of *action strongly-oriented* (A_s) were no different from the *action weakly-oriented* (A_w) cluster, in terms of the segmentation *plan* (management support was the only exception) and *fieldwork*, but had significantly better segmentation and sales success scores.

Table 6-12 Characteristics of Different Clusters (By *Action*)

	A_w (n=24)	A_s (n=62)	Mean Difference	Significance Level
***Plan*:**				
6. Formality	-0.13	0.05	0.18	0.54
3. Management support	-0.41	0.16	0.57	0.05 *
9. Morale and communication	-0.26	0.10	0.36	0.13
***Fieldwork*:**				
4. Adequate project resources	-0.10	0.04	0.14	0.64
8. The use of statistical packages	-0.16	0.06	0.22	0.37
10. Knowledge of the customer	0.01	0.00	-0.01	0.97
7. Customer group selection	0.04	-0.01	-0.05	0.83
5. SWOT analysis	-0.31	0.12	0.43	0.15
***Action*:** (see Table 6-6)				
Q.31 Segmentation success	2.75	3.98	1.23	0.00 **
Q.32 Sales success	3.06	4.04	0.98	0.00 **

* Significant at the 95% level
** Significant at the 99% level

6.2.4 Summary of the Cluster Analysis

Section 6.2 has shown the use of cluster analysis to divide the 86 cases into different clusters. The use of such an approach was meaningful as it helped to reveal the unexpected aspects of the data structure gathered from the questionnaire survey in this research. That is, the questionnaire responses can be divided into *homogeneous within* and *heterogeneous between* clusters, using the *plan*, *fieldwork* and *action* as clustering variables. For example, companies in the P_w group had negative factor scores in all of the ten factors, while the P_s companies had positive scores in all of the factors (see Table 6-13).

Table 6-13 summarises the characteristics of the clusters identified by using variables of the *plan*, *fieldwork* and *action* stages. It seems apparent that the 86 cases can be divided into distinct groups by the three different stages identified in the research. The three stages and the two groups identified in each stage will be further illustrated in the next section through a model building exercise designed to give a better understanding of the secrets of segmentation success.

Table 6-13 Factor Scores of Different Clusters

Factor	P_w (n=41)	P_s (n=45)	F_w (n=44)	F_s (n=42)	A_w (n=24)	A_s (n=62)
***Plan*:**						
6. Formality	-0.47	0.43 **	-0.13	0.13	-0.13	0.05
3. Management support	-0.45	0.41 **	-0.25	0.26 *	-0.41	0.16 *
9. Morale and communication	-0.69	0.63 **	-0.22	0.23 *	-0.26	0.10
***Fieldwork*:**						
4. Adequate project resources	-0.11	0.10	-0.36	0.38 **	-0.10	0.04
8. The use of statistical packages	-0.10	0.09	-0.64	0.67 **	-0.16	0.06
10. Knowledge of the customer	-0.20	0.18	-0.23	0.24 *	0.01	0.00
7. Customer group selection	-0.25	0.23 *	-0.26	0.27 **	0.04	-0.01
5. SWOT analysis	-0.13	0.12	-0.39	0.41 **	-0.31	0.12
***Action*:**						
1. Quality results	-0.31	0.28 **	-0.14	0.15	-1.22	0.47 **
2. Action on results	-0.10	0.09	-0.13	0.13	-0.82	0.32 **
Q.31 Segmentation success	3.21	4.10 **	3.38	3.95 **	2.75	3.98 **
Q.32 Sales success	3.59	3.97	3.61	4.00	3.06	4.04 **

* Difference between the two groups is significant at the 95% level
** Difference between the two groups is significant at the 99% level

6.3 A Double Check of the Three Stages

So far, this research has used factor analysis to identify ten factors, which have subsequently been grouped into three stages. The research has also shown that, using the factors in each of the three stages, the 86 cases can be divided into *weakly-oriented* and *strongly-oriented* groups in the *plan*, *fieldwork* and *action* stages. In the interests of caution, the following *weighted-mean method* (WMM)

was used to double-check that the three stages which have been identified really do exist.

6.3.1 Weighted-Mean Method (WMM)

The rationale and usage of the WMM have been discussed in section 5.2.1. The theory behind this method is not new, but the use of it to test if the *plan*, *fieldwork* and *action* stages are indeed distinct is not documented. Thus, the approach will be justified by comparing the case memberships obtained from the cluster analysis described above and by examining the confusion matrix generated from the WMM.

6.3.1.1 Calculation of Stage Scores

As shown in Table 6-14, which was derived from Table 5-16, the variance explained by each of the ten factors is different. The percentage of variance explained can be regarded as the importance of each factor and thus was used as a weight for calculating the scores of each case. This method enables the calculation of an average that takes into account the importance of each factor in the measurement of their impact toward segmentation success.

Table 6-14 Variance Explained (by Each Factor)

Factor	Activities in Q26 (see Table 5-16 for keys)	Variance explained (%)	Cumulative percentage (%)
1. Quality results	31, 30, 24, 22, 23	31.7	31.7
2. Action on results	26,25,27,29	9.3	41.0
3. Management support	5, 4, 6	7.0	48.0
4. Adequate project resources	9, 12, 10, 11	6.2	54.2
5. SWOT analysis	19, 20, 21	5.1	59.3
6. Formality	3, 2, 1	4.2	63.5
7. Customer group selection	17, 18	3.5	67.0
8. The use of statistical packages	13, 28, 15	3.5	70.5
9. Morale and communication	8, 7	3.3	73.8
10. Knowledge of the customer	14, 16	2.9	76.7

For example, the weighted score of the *plan* stage (including factors 6, 3 and 9) of a specific case can be calculated as:

$$Plan_{avg} = \frac{F6 * 4.2 + F3 * 7.0 + F9 * 3.3}{4.2 + 7.0 + 3.3}$$

where 4.2, 7.0 and 3.3 are the variances explained by each factor and are used as corresponding weights. Similarly, the weighted score of the *fieldwork* (including factors 4, 8, 10, 7 and 5) and *action* (including factors 1 and 2) stages of a specific case can be calculated as:

$$Fieldwork_{avg} = \frac{F4 * 6.2 + F8 * 3.5 + F10 * 2.9 + F7 * 3.5 + F5 * 5.1}{6.2 + 3.5 + 2.9 + 3.5 + 5.1}$$

$$Action_{avg} = \frac{F1 * 31.7 + F2 * 9.3}{31.7 + 9.3}$$

After the calculation of the three stage scores, the mean score was then used as the cutting point for each stage to divide the 86 cases into two different groups, *lower-half* and *upper-half*. *Student's t* tests were then employed to test if a significant segmentation score difference existed between the two groups. Table 6-15 shows that in all of the three stages, the differences between the two groups were significant at the 99% level. However, in Table 6-16, when a reverse check was employed, as was used in section 6.1 and illustrated in Table 6-3, it appeared that *fieldwork* was a *sufficient* but not *necessary* condition for segmentation success, as shown in Table 6-17. So, this weighted-mean method has come to the clear conclusion that the three stages are very distinct from one another. In Table 6-17, *fieldwork* appears to be a *sufficient* but not *necessary* condition for segmentation success. The reasons for this will be discussed in section 6.3.2.

Table 6-15 Segmentation Success Scores (at Each Stage)

Stage	Factors in the stage (see Table 5-16 for keys)	Lower Half	Upper Half	Mean Difference	Significance Level
Plan	6, 3, 9	3.26	4.05	0.79	0.00 **
Fieldwork	4, 8, 10, 7, 5	3.23	4.10	0.87	0.00 **
Action	1, 2	3.06	4.09	1.02	0.00 **

** Significant at the 99% level

Table 6-16 WMM Scores of Unsuccessful & Successful Projects

Stage	Factors in the stage (see Table 5-16 for keys)	Unsuccessful Segmentation	Successful Segmentation	Mean Difference	Significance Level
Plan	6, 3, 9	-0.15	0.09	0.23	0.01 **
Fieldwork	4, 8, 10, 7, 5	-0.05	0.05	0.09	0.12
Action	1, 2	-0.11	0.09	0.20	0.00 **

** Significant at the 99% level

Table 6-17 Segmentation Stages & Segmentation Success

Stage	Factors in the stage (see Table 5-16 for keys)	Stage as ID. V. (*sufficient*)	Stage as D. V. (*necessary*)
Plan	6, 3, 9	0.00 **	0.01 **
Fieldwork	4, 8, 10, 7, 5	0.00 **	0.12
Action	1, 2	0.00 **	0.00 **

ID. V: Independent Variable
D. V: Dependent Variable
** Significant at the 99% level

6.3.1.2 Justification of the WMM

Because the use of the weighted-mean method in this way is new, it is important to justify the adoption of this approach. Two methods were used to help with the justification. *First*, cross-tabulations were used to check the similarity of case classification between the memberships generated by the cluster analysis and the weighted-mean method. The results in Table 6-18 show that the group memberships generated by the WMM are very similar to those generated by cluster analysis, with similarity rates of 87.2%, 80.2% and 86.0% for the three stages respectively. Therefore, the adopting of WMM in this research, though

new, was valid. *Secondly*, a confusion matrix of discriminant analysis, as was employed in section 6.2.2.3, was used to check the correct classification rate of the weighted-mean method. The results in Table 6-19 show a very high correct classification rate, with 98.8%, 94.2% and 95.4% for the three stages respectively. This, again, ensures the validity of using the WMM approach in this way.

Table 6-18 Cross Tabulation of Cluster Analysis and WMM

Stage	Group generated by cluster analysis	Group generated by WMM		Correct Classification Rate (%)
		Weakly-oriented	Strongly-oriented	
Plan	P_w (n=41)	36	5	
	P_s (n=45)	6	39	87.2
Fieldwork	F_w (n=44)	36	8	
	F_s (n=42)	9	33	80.2
Action	A_w (n=24)	24	0	
	A_s (n=62)	12	50	86.0

Shaded areas show correctly classified cases

Table 6-19 Confusion Matrix of Weighted-Mean Method

Stage	Actual Group	Predicted Group		Correct Classification Rate (%)
		Weakly-oriented	Strongly-oriented	
Plan	P_{avgw} (n=42)	41	1	
	P_{avgs} (n=44)	0	44	98.8
Fieldwork	F_{avgw} (n=45)	42	3	
	F_{avgs} (n=41)	2	39	94.2
Action	A_{avgw} (n=36)	32	4	
	A_{avgs} (n=50)	0	50	95.4

Shaded areas show correctly classified cases

6.3.2 Discussion of the *PFA* Stages

In sections 6.3.1, this research has shown that the *plan*, *fieldwork* and *action* stages do exist in the segmentation process. However, the reasons why *fieldwork* is a *sufficient* but not *necessary* condition for segmentation success require explanation. To find out the reasons, validating interviews (see section 4.9) were conducted. Many possible answers came to light.

The *first* reason it that *fieldwork* may still be important but just not as important as the *plan* and *action* stages. In Table 5-16, the first three factors, which belong to *action* (factors 1 & 2) and *plan* (factor 3) stages, have already explained 48% of the variation in the data. So, perhaps it is not quite right to say that *fieldwork* is not important at all. It is just that *plan* and *action* are more important.

Secondly, it is possible that *fieldwork* may not be very important at the beginning. Academics may say that *fieldwork* is the heart of getting good results, but for marketing people who have much experience in the industry, maybe carrying out a few analyses using internal data will be enough for making necessary changes related to market segmentation. That is, one need not go through the *plan*, *fieldwork* and *action* stages to get an initial idea of what to do about market segmentation.

Thirdly, it is possible that *fieldwork* is a *hygiene factor* in the success of a segmentation project. The concept of hygiene factor originated with Herzberg. He (1968: 71-91) terms *motivator factors* those job characteristics that make people feel exceptionally good about their jobs. These include the challenge of the work, recognition for doing a good job, the responsibility associated with the work, prospects for advancement, and a sense of achievement. These factors lead to job satisfaction and motivate employees. On the other hand, Herzberg calls *hygiene factors* those job characteristics that do not directly motivate workers but that cause dissatisfaction when they are absent. These factors include money, job security, working conditions, technical supervision, and company policies. By giving people competitive salaries, good working conditions, and job security, managers can prevent dissatisfaction.

Just as money, job security and working conditions are the *hygiene factors* in a motivation theory, in this research *fieldwork* can be viewed as a *hygiene factor* in a segmentation project. The reason is that the degrees of *fieldwork* do

not differ between unsuccessful and successful projects. However, lack of it may result in a lower segmentation success score.

Fourthly, any sensible segmentation operation goes through planning, collecting data, deciding what a company should do, and then taking action. This *plan-fieldwork-action* procedure can be referred to as ***downstream segmentation*** (see section 6.4.1 for further discussion). However, in many cases, companies just have not got the time to follow the formal *plan-fieldwork-action* process (e.g., Bhide 1986: 59; McCarthy & Perreault 1984: 140; Nelson & Clutterbuck 1988: 11). Instead, they may take the *upstream* route. That is, they start with action. Once they get good results they will soon learn that, to do an even better segmentation job, they need more data. So, they will try harder to get good data. Then, again, they will learn they have to have a systematic way of gathering data. That is, they need a good plan for conducting market research (Wilson 1979: 108). So, they are actually following the *action-fieldwork-plan* route. This can be referred to as ***upstream segmentation*** (see Figure 6-5 for illustration).

During the validating interviews it was found that, in many cases, companies might follow an *upstream* route because they have to make quick decisions. For example, one company manager said that his colleagues and he did a bit of internal research to discover how many customers they had in a certain market segment. They also considered the size of the opportunity and how well they were positioned in terms of recognising the opportunities. That was a half an hour exercise, but from the discussion they realised that there was a mismatch between the market segments and the company resources, so they took some action to focus more on the important customers. As a result, the company was able to increase its sales by 20%. This is a good example of *upstream segmentation.* However, as the company grows bigger, or as people become more familiar with the process, they begin to look for greater accuracy. They will put in a plan for a systematic way of getting more reliable data and then take action based on the results from the information gathered. This is the *downstream* approach.

These four reasons help to explain why *fieldwork* is a *sufficient* but not *necessary* condition for segmentation success.

6.4 The *PFA* Market Segmentation Model

Based on the three distinct stages identified, this research tried to develop a model for assessing segmentation success. According to O'Muircheartaigh and Payne (1977: 37), a *model* can be regarded as *an imitation of something on a smaller scale*. While representing the complexity of a real situation, a good model may lose some details, but it must abstract and preserve the essentials of the reality.

O'Muircheartaigh and Payne (1977: 37-38) further suggest that a model can be conceptualised as a *black box* like the one in Figure 6-4. In the figure, there are some independent variables going in, and some dependent variables coming out. The essence of the *black box* is that one can see the outside, but not the inside. It is assumed to take the observed independent variables, work on them in some unknown way, and thereby produce the observed values of the dependent variables. This is what the researcher intended to do. In this section, a *plan, fieldwork, action* (***PFA***) model will be developed and discussed. Its mechanism will also be explained.

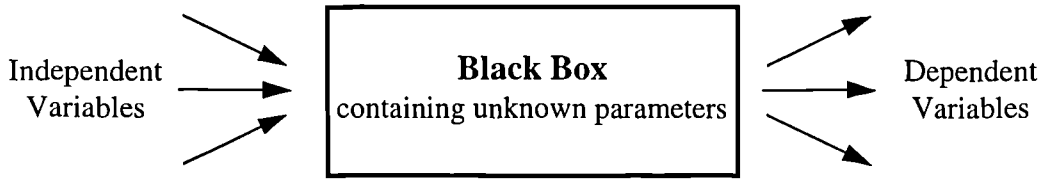


Figure 6-4 Black Box

6.4.1 Model Development

To get a better picture of how the *plan, fieldwork* and *action* stages influence segmentation success, the following ***PFA*** model, shown in Figure 6-5 was

developed. The three outer circles represent the three stages of a segmentation project. The curves that connect the three circles indicate that, given the dynamic nature of markets, the three stages together are an ongoing process and should be periodically studied. In the centre of the model is "segmentation success." The lines from the three stages, pointing to the centre, indicate that each stage can influence the success of a segmentation project.

The grey lines from the centre pointing outward to the three stages imply that the experience gained from segmentation success can help refine and improve the different stages in a segmentation project and hence help increase the odds of segmentation success. These issues are not within the scope of this research. However, based on the responses from the validating interviews, the researcher found that a successful experience of segmentation can have an impact on the three stages. As Weinstein (1987: 6) points out, "*Segmentation is a marketing discipline that can be acquired and enhanced by experience ...,*" it would be interesting for further research to investigate how the experience of segmentation success actually influences future segmentation projects (see section 7.5.9 for discussion).

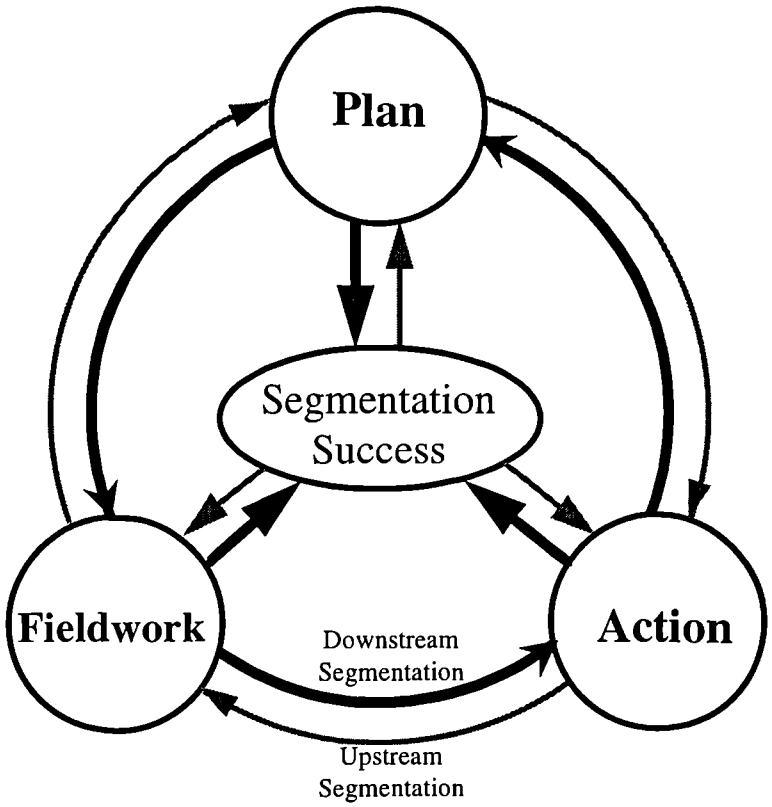


Figure 6-5 The *PFA* Market Segmentation Model

These three stages - *plan*, *fieldwork* and *action* - make up the segmentation process. No one of these individual stages alone results in segmentation, and segmentation can be thought of as the linking of these stages into a continuous process. Indeed, it seems that each of the ***PFA*** stages must have been undertaken with care if successful segmentation is to be achieved.

In the *plan* stage, first of all, the objective is to set up a clear plan for achieving the goal of the segmentation project. This should preferably be done with the total support of top management and the assignment of team members who have high morale and who communicate effectively with on another. Then, with adequate project resources such as money, time and manpower, the important thing in the *fieldwork* stage is to collect information about the market, customers and competitors. Also important at this stage are the grouping of the customers and selection of customer groups. In the *action* stage, management in the

company must take action based on the results from the project so as to achieve the benefits of the segmentation approach. This counter-clockwise process can be referred to as ***downstream segmentation***. In contrast, the clockwise process, that is, the *action-fieldwork-plan* route, can be referred to as ***upstream segmentation*** (see section 6.3.2 for discussion).

As Foote (1969: 29) claims, "market segmentation has to be viewed as a continuous process ...," it makes intuitive and apparently logical sense that the *plan*, *fieldwork* and *action* stages together are an ongoing circle. In addition, repetition of the ***PFA*** circle may lead to more effective segmentation. However, the proof of this argument is beyond the scope of the study and will have to be left for further research.

6.4.2 Mechanism of the *PFA* Model

> *"Over the past decade, an increasing amount of attention has been devoted to the development, presentation, and discussion of relatively comprehensive theories and models of consumer behavior. Five years ago, Kollat et al.* [1972: 577] *noted: 'These models have had little influence on consumer behavior research during the last five years. Indeed, it is rare to find a published study that has utilized, been based on, or even influenced by, any of the models identified above.' Unfortunately, not much has changed since then."*
>
> *(Jacoby 1978: 88)*

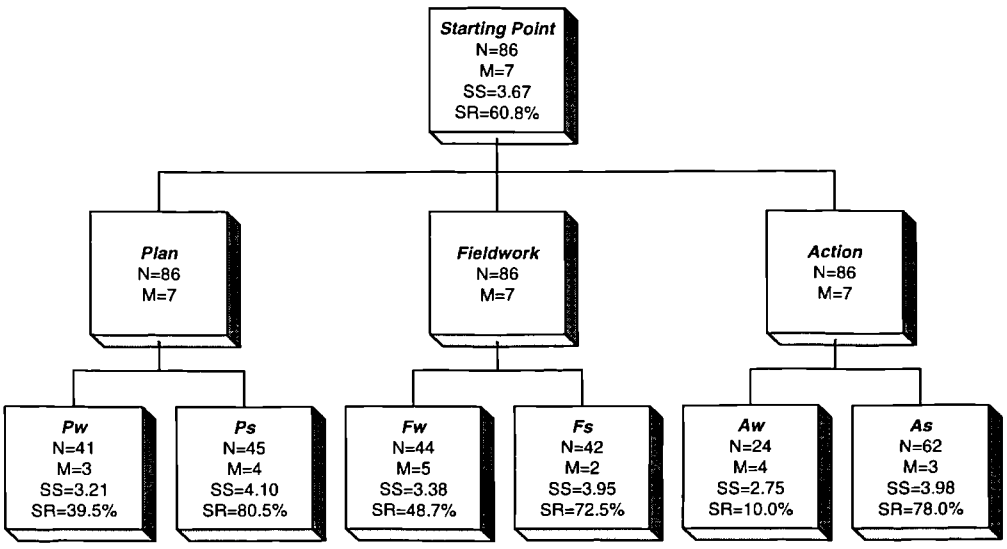
This research has developed the so-called "***PFA*** Model." At this juncture it is important to consider two fundamental questions. *First*, can it be called a model? *Secondly*, does the ***PFA*** model really work?

As discussed in section 6.4, a *model* can be regarded as a simplified, but structured and valid representation of a real-life system or process. Alternatively, a model can be regarded as a simple way of explaining how something complicated works (Sampson 1995: 1). Sampson further contends that a good model must be understandable and must explain (1995: 2). Therefore, for the

PFA model to be useful, it must demonstrate that it reflects reality - that it "works." In this section, the ***PFA*** model will be used to provide an explanation of why some segmentation projects were successful while others were not. This will provide the required test of whether the model actually works.

To demonstrate how the ***PFA*** model works, Figure 6-6 was created based on the cluster analysis carried out earlier. As before, the 86 cases were divided into *weakly-oriented* and *strongly-oriented* groups in three different ways, using factors in each of the *plan, fieldwork* and *action* stages.

When the *segmentation score* (SS) and *success rate* (SR) of each box are compared, a very clear pattern emerges (see Figure 6-6). The SS and SR of the *strongly-oriented* clusters are consistently higher than their *weakly-oriented* counterparts. In addition, it is clear that the three stages have different impacts on segmentation success. In the *plan* stage, the success rate difference between the two groups was **41%** (80.5%-39.5%). In the *fieldwork* and *action* stages, the differences were **23.8%** (72.5%-48.7%) and **68%** (78%-10%) respectively.

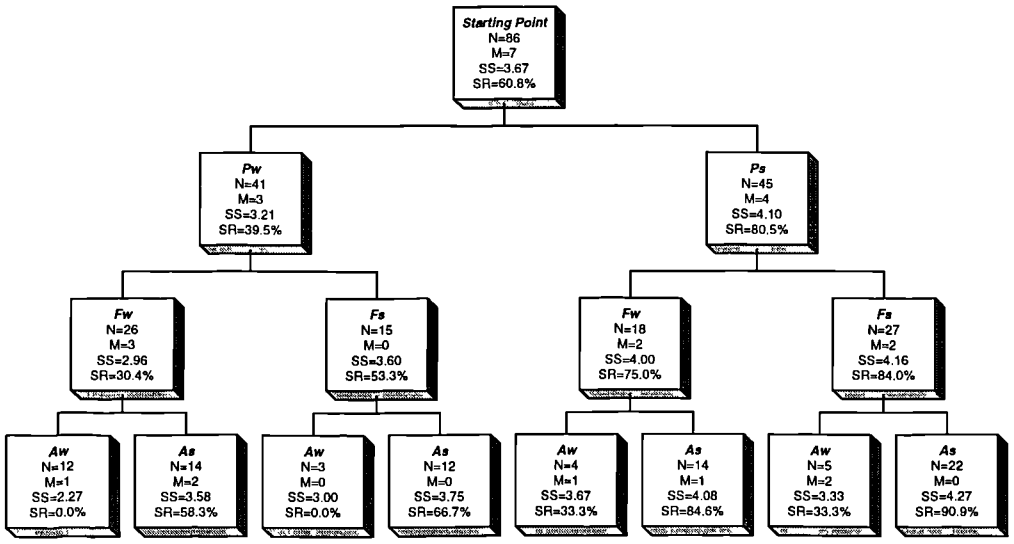


N: Sample size
M: Missing success score
SS: Success score
SR: Success rate

Figure 6-6 The *PFA* Model and Segmentation Success Rates

Figure 6-6 can be further broken down in a chronological order as illustrated in Figure 6-7. All 86 cases can be assigned to boxes at different levels, *plan* level, *plan-fieldwork* level and *plan-fieldwork-action* level. The success rates of the *weakly-oriented* cases were consistently lower than those in the *strongly-oriented* groups, indicating the ***PFA*** model can indeed explain the complex nature of segmentation success.

Take for example, P_w-F_w-A_w in the extreme left box in Figure 6-7. This has 12 cases with one missing success score value. *None of the remaining 11 cases* was successful. However, in the extreme right box, P_s-F_s-A_s has 22 cases and no missing value. The success rate of this cluster is 90.9%, which means *10 out of 11* were successful. The comparison of the two extremes did show that the ***PFA*** model can tell successful segmentation projects from unsuccessful ones and explain why successful projects were successful.



N: Sample size
M: Missing success score
SS: Success score
SR: Success rate

Figure 6-7 Chances of Segmentation Success

To have a clearer view of Figure 6-7, a line chart was produced as shown in Figure 6-8. This line chart shows clearly the change of segmentation success rates

of a segmentation project in different *plan*, *fieldwork* and *action* conditions. In general, the success rate of a segmentation project is 60.8%. The rate will increase approximately 20% (up to 80.5%) for a *plan strongly-oriented* project, and decrease 20% (down to 39.5%) for a *plan weakly-oriented* project. This pattern remains the same in the *fieldwork* and *action* stages, but with different magnitudes.

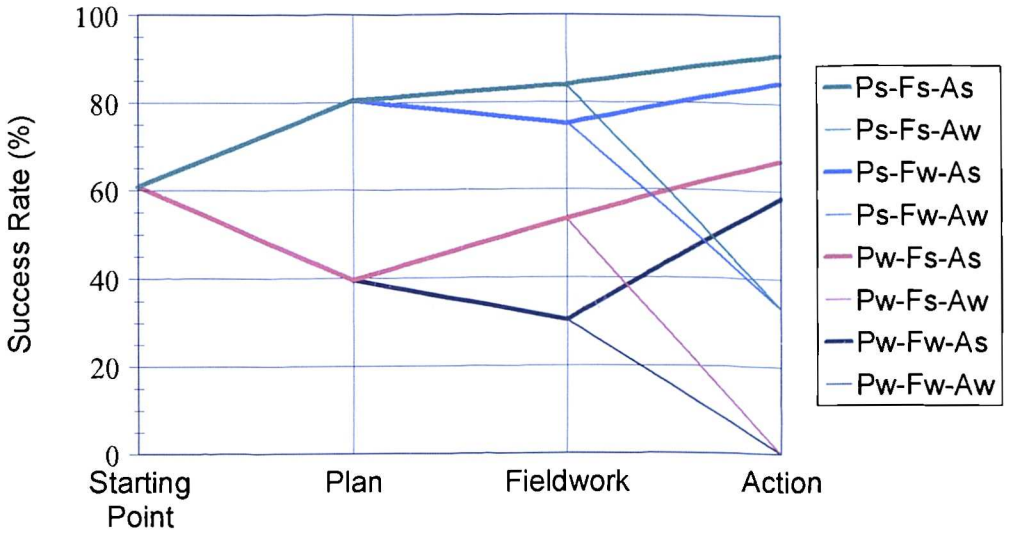


Figure 6-8 Change of Segmentation Success Rates

An interpretation of Figure 6-8 which can help visualise the 86 cases is that the intersections where the eight lines meet the *action* stage can be viewed as eight different tribes. They all came from the same origin, but through various emigration routes have settled down in different locations. Also, like a prism which can be used to separate sunlight into a spectrum, the figure shows clearly not only the eight clusters but also the reasons why they have their particular success rates.

It is important to point out that Figure 6-8 should be interpreted as: even with *limited* plan and *limited* fieldwork, a company can still benefit from taking segmentation action towards meeting its customers' demands. It should not be interpreted as: even with *wrong* plan and *wrong* fieldwork, as long as the company

is *strongly-oriented* in *action*, the results will still be successful. After all, no company will deliberately act irrationally (Waters 1989: 552).

6.4.3 Possible Extraneous Interventions

As discussed in section 4.2, in studying the relationships between independent and dependent variables, there may exist some extraneous variables which, if not controlled adequately, can jeopardise the explanation of the true relationships between the studied variables. In this research, as suggested by Creswell (1994: 63), the demographic items were treated as extraneous variables.

Before considering the impact of extraneous variables, the success rates of the *weakly-oriented* and *strongly-oriented* groups in each of the ***PFA*** stages are shown in Table 6-20 (see also Figure 6-6). The results of taking into consideration the extraneous variables are shown in Table 6-21. Comparing the two tables, it can be found that the success rates of the cells in Table 6-21 are similar to the corresponding reference rates in Table 6-20, indicating that the intervention of extraneous variables in this research is negligible.

Table 6-20 Success Rates of Different Clusters (N=79)

	Plan		*Fieldwork*		*Action*	
Segmentation project	P_w (n=38)	P_s (n=41)	F_w (n=39)	F_s (n=40)	A_w (n=20)	A_s (n=59)
Success rate (%)	39.5	80.5	48.7	72.5	10.0	78.0
Failure rate (%)	60.5	19.5	51.3	27.5	90.0	22.0
Total percent	100.0	100.0	100.0	100.0	100.0	100.0

Shaded cells represent reference success rates

Table 6-21 Possible Intervention of Extraneous Variables

	Plan		*Fieldwork*		*Action*	
Success rate (%)	P_w (n=38)	P_s (n=41)	F_w (n=39)	F_s (n=40)	A_w (n=20)	A_s (n=59)
• **Years of operation**						
Fewer than 20 years	33.3	91.3	50.0	78.3	22.2	78.1
More than 20 years	45.0	70.6	50.0	64.7	-	80.8
• **Number of employees**						
Fewer than 99	39.3	79.3	51.7	67.9	12.5	78.9
More than 100	40.0	83.3	40.0	83.3	-	77.8
• **Company's 1993 turnover**						
Under £9 million	40.0	80.0	51.5	70.4	12.5	77.3
More than £10 million	42.9	88.9	25.0 *	83.3	-	84.6
• **Company ownership**						
British & jointly owned	34.5	80.0	45.2	71.4	6.3	76.7
Mainly foreign owned	55.6	77.8	50.0	75.0	25.0 *	78.6
• **Customer numbers**						
Fewer than 999	36.8	86.4	60.6	66.7	8.3	86.2
More than 1,000	36.0	81.0	40.9	70.8	7.1	78.1

* not very close to the correspondent rates in Table 6-20 owing to small sample size
\- indicate cells with zero sample size

6.4.4 *PFA* Model and Venn Diagrams

While Figures 6-7 and 6-8 are fairly comprehensive, they fail to show the possible relationships between the *plan* and *action* stages. This is because they were produced according to the chronological order of the three stages. Therefore, another approach for describing the ***PFA*** model using Venn diagrams of *sets theory* was introduced. The adoption of the Venn diagram in this research provides a method for describing interrelationships amongst more than one subset (Kaye 1969: 137). In the Venn diagrams, only the 79 cases with known segmentation success scores were included. Based on the calculation of Table 6-22 to Table 6-24, four figures (Figure 6-9 to Figure 6-12) were produced.

Table 6-22 Success Rates of Different Clusters (Single Stage)

Cluster	Number of cases	Successful cases	Success rate (%)
P_w	38	15	39.5
P_s	41	33	80.5
F_w	39	19	48.7
F_s	40	29	72.5
A_w	20	2	10.0
A_s	59	46	78.0
Total cases	79	48	60.8

Table 6-23 Success Rates of Different Clusters (Two Stages)

Cluster	Number of cases	Successful cases	Success rate (%)
P_w- F_w	23	7	30.4
P_w- F_s	15	8	53.3
P_s- F_w	16	12	75.0
P_s- F_s	25	21	84.0
F_w- A_w	14	1	7.1
F_w- A_s	25	18	72.0
F_s- A_w	6	1	16.7
F_s- A_s	34	28	82.4
P_w- A_w	14	0	0.0
P_w- A_s	24	15	62.5
P_s- A_w	6	2	33.3
P_s- A_s	35	31	88.6
Total cases	79	48	60.8

Table 6-24 Success Rates of Different Clusters (Three Stages)

Cluster	Number of cases	Successful cases	Success rate (%)
P_w-F_w-A_w	11	0	0.0
P_w-F_w-A_s	12	7	58.3
P_w-F_s-A_w	3	0	0.0
P_w-F_s-A_s	12	8	66.7
P_s-F_w-A_w	3	1	33.3
P_s-F_w-A_s	13	11	84.6
P_s-F_s-A_w	3	1	33.3
P_s-F_s-A_s	22	20	90.9
Total cases	79	48	60.8

Using a Venn diagram approach, various operations can be used to create new sets from old. Basically, these operations comprise *intersection*, *union* and *complement* (Dewhurst 1988: 60; LeCuyer 1978: 6-10).

Let A and B be two sets. The *intersection* of A and B, symbolised by $A \cap B$, is the set of elements common to A and B, that is, $A \cap B = \{x \mid x \in A \text{ and } x \in B\}$. The *union* of A and B, symbolised by $A \cup B$, is the set of elements common to A and B, that is, $A \cup B = \{x \mid x \in A \text{ or } x \in B\}$. The *complement* of A, symbolised by A', is the set of elements not in A but still in the universal set U, that is, $A' = \{x \in U \mid x \notin A\}$. Here, the *universal* set, U, consists of all of the elements under consideration in the discussion.

Take the *plan* stage Venn diagram in Figure 6-9 (the top) for example. P_s is denoted by the circle in the centre. The Venn diagram for P_w (= P_s') is given by the shaded region. P_s and P_w together make up the universe U. That is, the probability of a segmentation project from P_s set plus the probability that it is from P_w equal 1. This is written: P(P_s) + P(P_w) = 1 (Mason & Lind 1993: 173). The success rates of the two sets, 80.5% and 39.5%, are also shown in the figure.

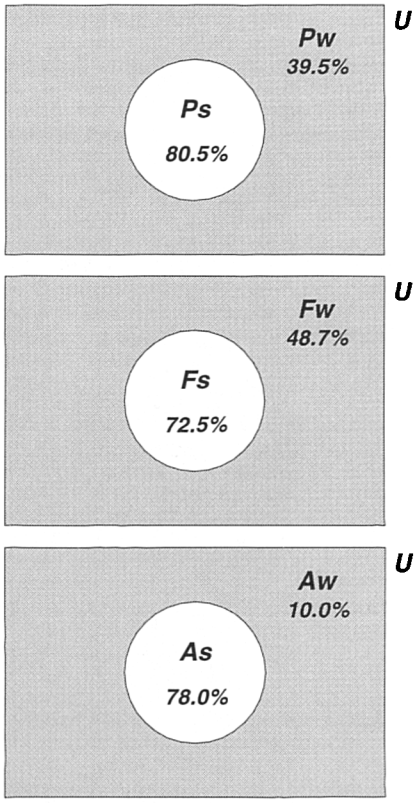


Figure 6-9 Impact of Single Stage

It is possible to produce many Venn diagrams using different clusters from the ***PFA*** model. The success rate of P_s is 80.5%, as denoted in Figure 6-9. However, when taking the *fieldwork* stage into consideration, the success rate of P_s becomes 84.0% if the project is also *fieldwork strongly-oriented*, as shown in Figure 6-10. The success rate of P_s will drop to 75.0% if the project is *fieldwork weakly-oriented*. In the same manner, the success rate of $(P_s' \cap F_s)$ is 53.3% and 30.4% for $(P_s \cup F_s)'$.

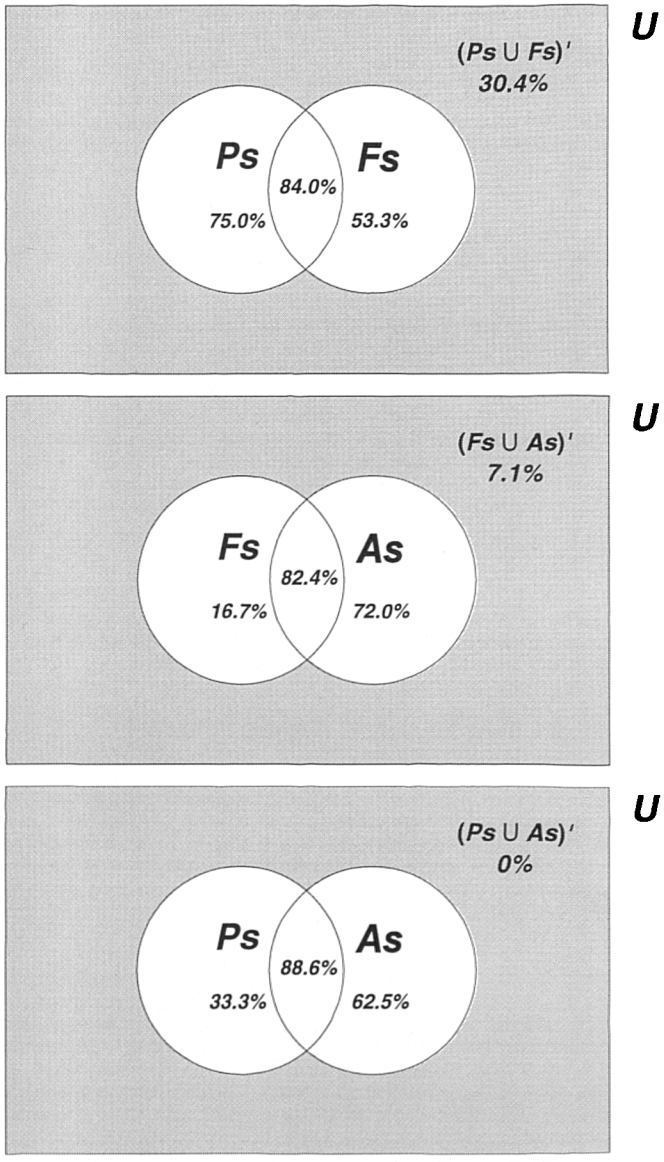


Figure 6-10 Combined Impact of Two Stages

When considering all of the three stages together, Figure 6-11 and Figure 6-12 can be produced. The two figures help to visualise the impact of each stage and the combined impact formed by the overlapping parts of the *plan, fieldwork* and *action* stages.

Just as mountaineers need maps to show them the way for climbing high mountains, Figure 6-11 and Figure 6-12 can serve as maps for climbing the segmentation mountain. They can be of great help to marketers in implementing their segmentation projects. Figure 6-11 shows the routes to reach the ***segmentation summit***. Though P_s and A_s can be of great help in ensuring a high success rate, only the best project, strong on all of the three stages would have the highest chance (90.9%) of success.

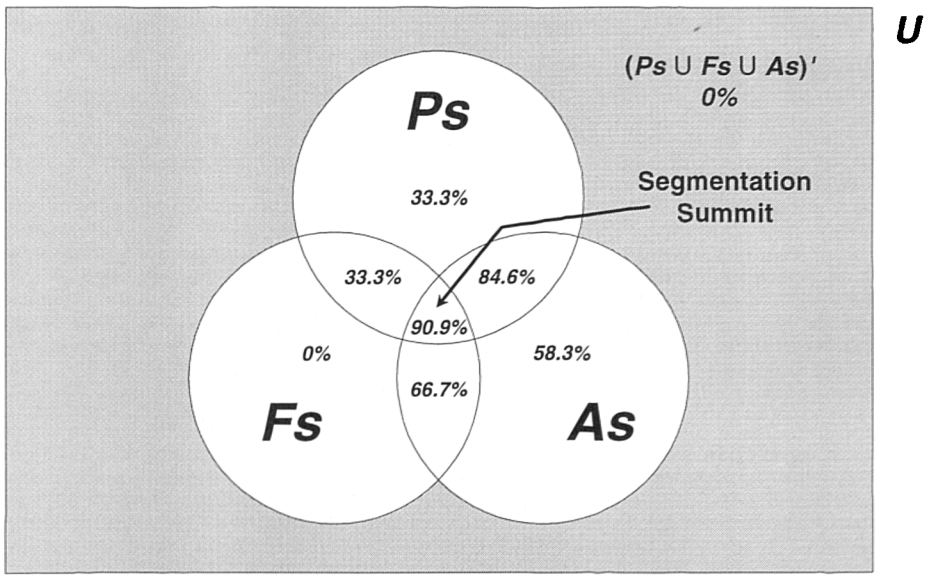


Figure 6-11 The Routes to the Segmentation Summit

Figure 6-12 shows the crevasses in launching a segmentation project. A marketing manager must be careful because the drop of A_w is extremely big (from 90.9% down to 33.3%). If not carefully managed, a segmentation project could easily fall down the P_w-A_w and the P_w-F_w-A_w crevasses and lie at the bottom of a ***segmentation black hole***.

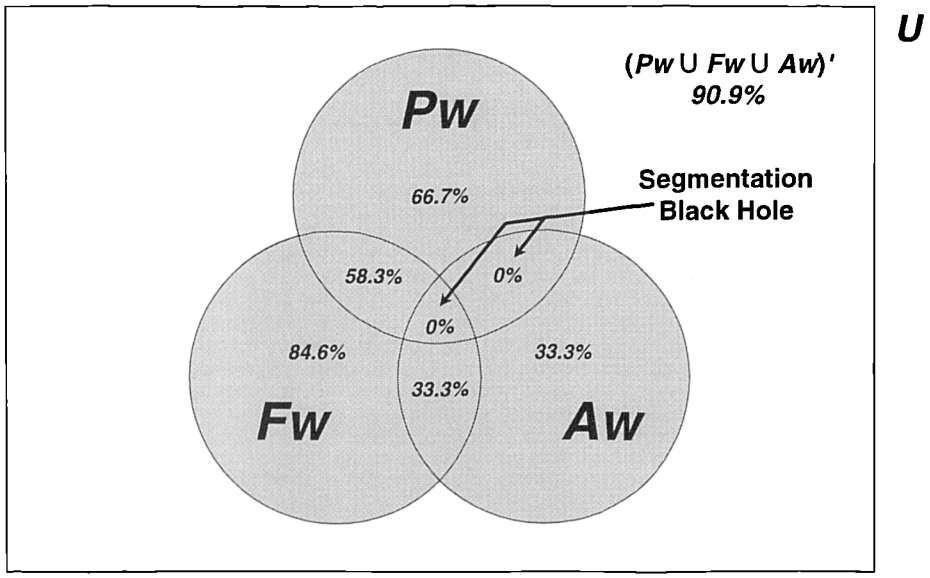


Figure 6-12 The Crevasses to the Segmentation Black Hole

The use of Venn diagrams in this section helps to visualise the relationships between the three stages. However, it has to be pointed out that the use of Venn diagrams *does not* imply that there are precisely defined boundaries between the *weakly-oriented* and *strongly-oriented* clusters in each of the *plan*, *fieldwork* and *action* stages.

From the dendrograms in Figures 6-1 to 6-3, two clusters in each of the *plan*, *fieldwork* and *action* stage were identified. The classification scheme seems to imply that, in terms of the ***PFA*** stage, a market segmentation project can belong either to a *weakly-oriented* or a *strongly-oriented* group without any degree of ambiguity. This dichotomous notion can be referred to as the *crisp sets* concept, as opposed to the *fuzzy sets* theory (Klir & Yuan 1995: 5; Zimmermann 1991: 1).

An investigation into the scatter diagram shown in Figure 6-13, however, indicated that there is actually a *fuzzy* edge between the two clusters of the *action* stage[1].

The fuzziness between the boundary of the *weakly-oriented* and the *strongly-oriented* groups implies that the assignment of a market segmentation project to groups in the ***PFA*** model is a *more-or-less* rather than *yes-or-no* type of consideration. While a deeper exploration into the fuzziness issue is beyond the scope of this study, suggestions for further research will be discussed in section 7.5.11.

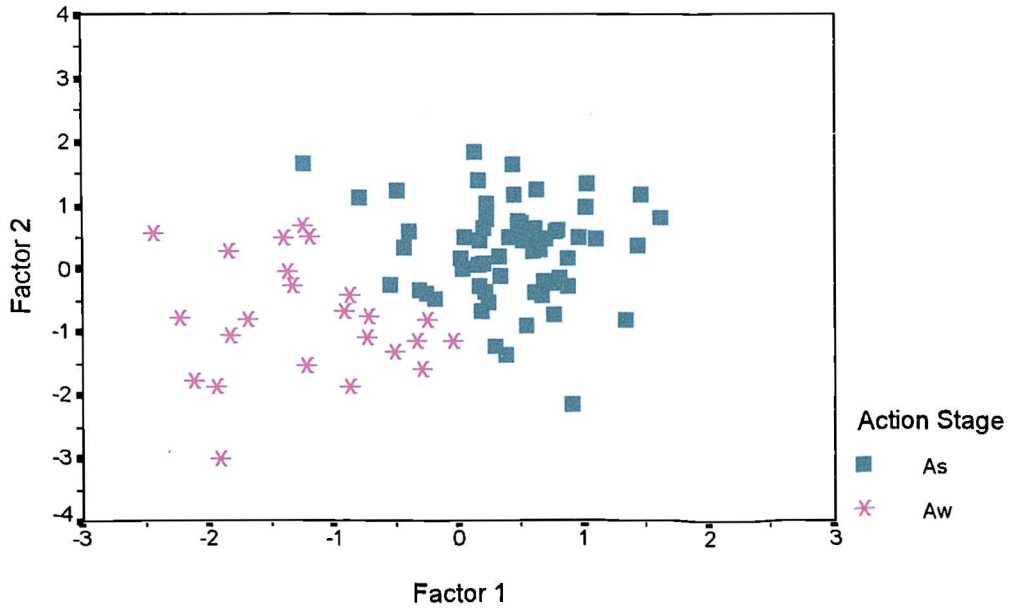


Figure 6-13 Scatter Diagram of A_w and A_s Groups

6.4.5 *PFA* Model and Bayes' Theorem

> *"Bayes' theorem offers a powerful statistical method of evaluating new information and revising our prior estimates (based upon limited information only) of the probability that things are in one state or another.* ***If correctly used,***

[1] Visual inspection in N dimensions is difficult. Therefore, only the *action* stage was plotted as there are just two factors in it.

only) of the probability that things are in one state or another. ***If correctly used, it makes it unnecessary to gather masses of data over long periods of time in order to make good decisions based upon probabilities.***"

(Levin & Rubin 1994: 172-173)

This research has demonstrated the calculation of success rates of groups of different stage status (*weakly-oriented* and *strongly-oriented*). It would be valuable to know, from the consulting and diagnostic viewpoint, what the chances are for a segmentation project to be, for example, *plan weakly-oriented*, if it is proved to be unsuccessful. For this purpose, Bayes' theorem provides a useful tool for analysing the data (e.g., Green 1963; Roberts 1963). So, this research goes a step further to investigate the combination of the ***PFA*** model and Bayes' theorem.

6.4.5.1 Bayes' Probabilities of Successful Project

To calculate Bayes' probabilities, Table 6-25 and Table 6-26 were produced. P($S|E$), called *conditional probability*, is the probability that "success (S)" will occur given that a specific "event (E)" has occurred. P($E \cap S$), called *joint probability*, is the probability that both "E" and "S" will occur. And P(E), called *prior probability*, is the probability that "E" will occur, whether or not "S" happens. Bayes' probability of a specific cluster "E_i", given that "S" has occurred, can then be obtained by (Mason & Lind 1993: 186):

$$P(E_i|S) = \frac{P(E_i \cap S)}{P(E_1) * P(S|E_1) + P(E_2) * P(S|E_2) + \cdots + P(E_n) * P(S|E_n)}$$

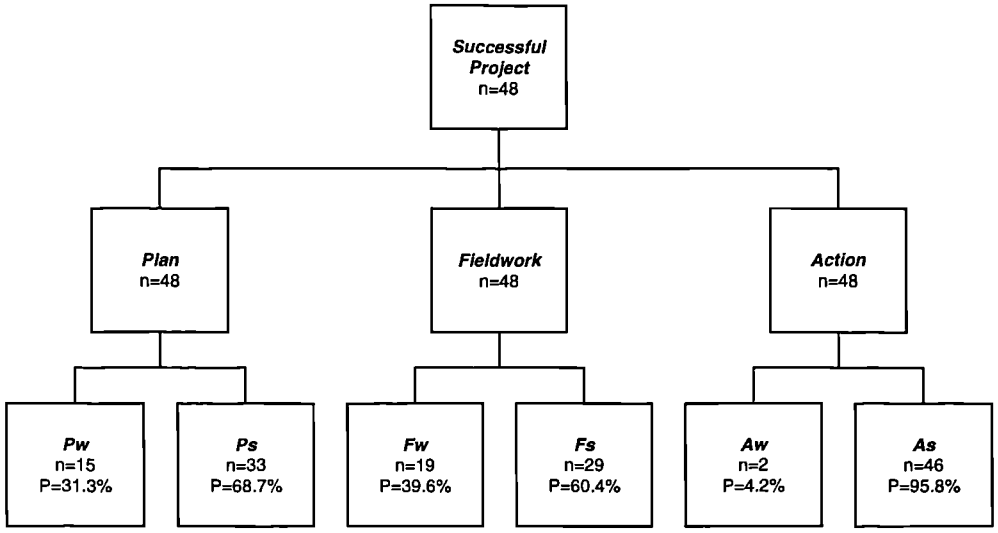
Table 6-25 Bayes' Probabilities of Successful Cases (by Single Stage)

Events	Number of cases	P(E)	Successful cases	P(S|E)	P(E ∩ S)	P(E|S)
P_w	38	0.481	15	0.395	0.190	0.313
P_s	41	0.519	33	0.805	0.418	0.687
F_w	39	0.494	19	0.487	0.240	0.396
F_s	40	0.506	29	0.725	0.367	0.604
A_w	20	0.253	2	0.100	0.025	0.042
A_s	59	0.747	46	0.780	0.583	0.958
Total	79	1.000	48	-	0.608	1.000

Table 6-26 Bayes' Probabilities of Successful Cases (by Three Stages)

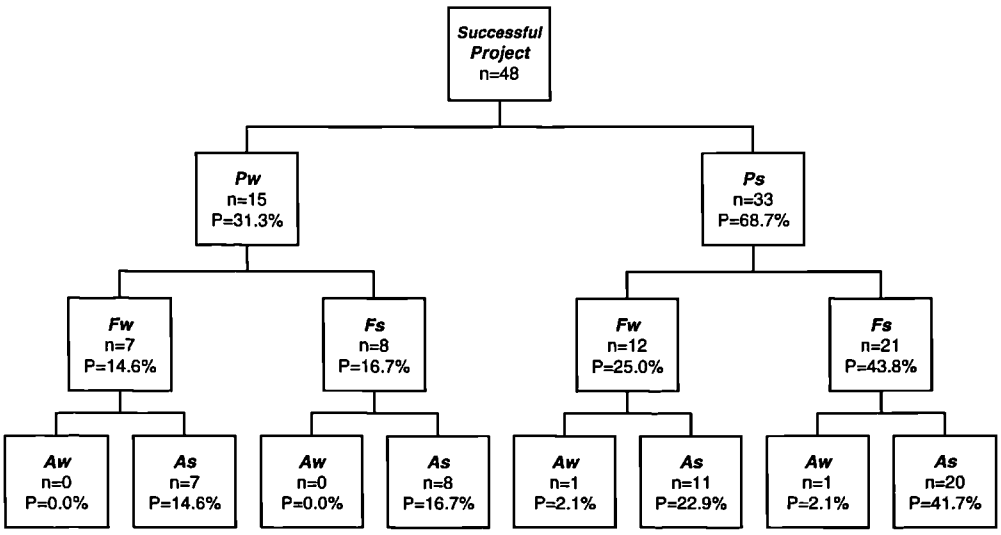
Events	Number of cases	P(E)	Successful cases	P(S|E)	P(E ∩ S)	P(E|S)
P_w-F_w-A_w	11	0.139	0	0.000	0.000	0.000
P_w-F_w-A_s	12	0.152	7	0.583	0.089	0.146
P_w-F_s-A_w	3	0.038	0	0.000	0.000	0.000
P_w-F_s-A_s	12	0.152	8	0.667	0.101	0.167
P_s-F_w-A_w	3	0.038	1	0.333	0.013	0.021
P_s-F_w-A_s	13	0.165	11	0.846	0.139	0.229
P_s-F_s-A_w	3	0.038	1	0.333	0.013	0.021
P_s-F_s-A_s	22	0.279	20	0.909	0.253	0.417
Total	79	1.000	48	-	0.608	1.000

In Table 6-25, the *posterior probability* that a project is *action weakly-oriented*, given that it is a successful project, is 0.042. The interpretation of this conclusion can be of great value in better understanding the nature of successful segmentation projects. If a segmentation project is selected at random from the population, the probability that it is *action weakly-oriented* (A_w) is 0.253 (according to the ***PFA*** model, 20 out of the 79 responses were *action weakly-oriented*). However, if the project is found to be successful, the probability that the project is *action weakly-oriented* is decreased about six-fold, from 0.253 to 0.042. In the same way, the probability that a segmentation project is P_w-F_w-A_w is 0.139. If the project is found to be successful, then the probability that it is P_w-F_w-A_w is decreased to 0. Figures 6-14 and 6-15 give a graphic view of the association of Bayes' theorem with the ***PFA*** model.



n: Number of successful projects
P: Bayes' probability

Figure 6-14 Bayes' Probabilities of *PFA* Stages (Successful Cases)



n: Number of successful projects
P: Bayes' probability

Figure 6-15 Bayes' Probabilities of Different *PFA* Status (Successful Cases)

6.4.5.2 Bayes' Probabilities of Unsuccessful Project

Similarly, Bayes' probabilities of unsuccessful projects can also be calculated. Taking the 31 unsuccessful segmentation projects as a whole, their

Bayes' probabilities are calculated in Table 6-27 and Table 6-28. The results were further depicted in Figures 6-16 and 6-17.

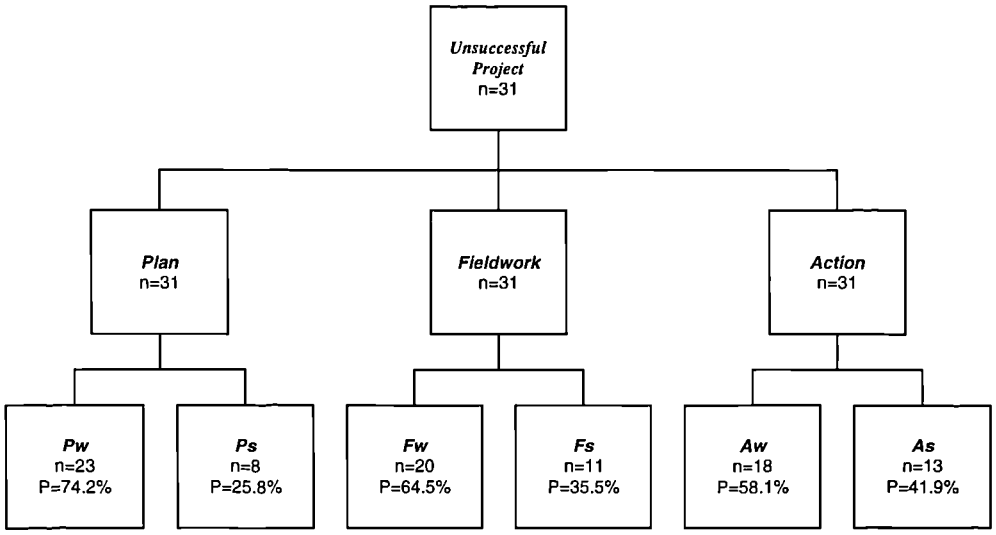
Table 6-27 Bayes' Probabilities of Unsuccessful Cases (by Single Stage)

Events	Number of cases	P(E)	Unsuccessful cases	P(U|E)	P(E ∩ U)	P(E|U)
P_w	38	0.481	23	0.605	0.291	0.742
P_s	41	0.519	8	0.195	0.101	0.258
F_w	39	0.494	20	0.513	0.253	0.645
F_s	40	0.506	11	0.275	0.139	0.355
A_w	20	0.253	18	0.900	0.228	0.581
A_s	59	0.747	13	0.220	0.164	0.419
Total	79	1.000	31	-	0.392	1.000

Table 6-28 Bayes' Probabilities of Unsuccessful Cases (by Three Stages)

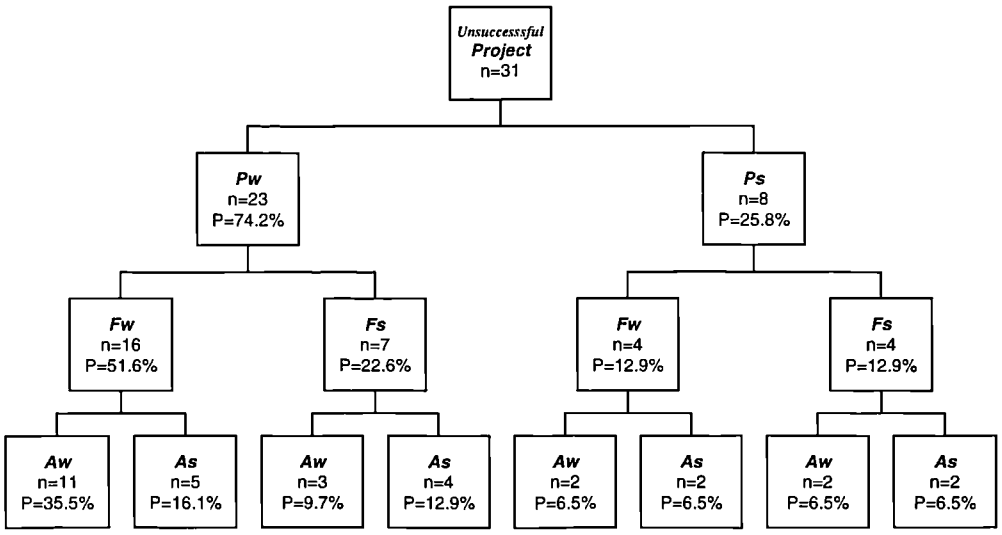
Events	Number of cases	P(E)	Unsuccessful cases	P(S|E)	P(E ∩ S)	P(E|S)
P_w-F_w-A_w	11	0.139	11	1.000	0.139	0.355
P_w-F_w-A_s	12	0.152	5	0.417	0.063	0.161
P_w-F_s-A_w	3	0.038	3	1.000	0.038	0.097
P_w-F_s-A_s	12	0.152	4	0.333	0.051	0.129
P_s-F_w-A_w	3	0.038	2	0.667	0.025	0.065
P_s-F_w-A_s	13	0.165	2	0.154	0.025	0.065
P_s-F_s-A_w	3	0.038	2	0.667	0.025	0.065
P_s-F_s-A_s	22	0.279	2	0.091	0.025	0.065
Total	79	1.000	31	-	0.392	1.000

The association of Bayes' probability with unsuccessful segmentation projects can be especially valuable for diagnosing a segmentation project and for segmentation consulting purposes. For example, the probability that a segmentation project is *plan weakly-oriented* is 0.481. However, if the project is found to be unsuccessful the likelihood that it is *plan weakly-oriented* rises to 0.742. By combining the ***PFA*** model and Bayes' theorem, a marketing manager can better detect the problems inherent in a segmentation project.



n: Number of unsuccessful projects
P: Bayes' probability

Figure 6-16 Bayes' Probabilities of *PFA* Stages (Unsuccessful Cases)



n: Number of unsuccessful projects
P: Bayes' probability

Figure 6-17 Bayes' Probabilities of Different *PFA* Status (Unsuccessful Cases)

6.4.6 *PFA* Model versus *STP* Model

"Heresy, according to one source, is a set of ideas, opinions, or practices which deviate from the accepted body of beliefs, customs, and practices in an organized

endeavor. ... there is an insufficient volume of heresy in marketing thought, an insufficient number of deviant practices, thoughts, and beliefs."

(Zaltman & Bonoma 1984: 329)

Having developed the ***PFA*** model and explained the mechanism of it, the researcher then considered the differences between the ***PFA*** and the long claimed ***STP*** model (Kotler 1991: 263). A careful investigation of both models showed that they are different in several ways.

First, the ***PFA*** model looks at segmentation as an integrated project with different stages in its process, while the ***STP*** sees segmentation as three different parts, each having its own objective. In this respect, the ***PFA*** model is consistent with the assertion of Mahajan and Jain (1978: 339), that market segmentation and resource allocation are closely intertwined and should not be separated. *Secondly*, market segmentation is in fact an ongoing process (Foote 1969: 29) with many activities within it. These activities often have to be conducted in a back and forth manner. The *downstream* and *upstream* concepts within the ***PFA*** model can explain what is happening in the business world, while in the ***STP*** model, this issue seems to have been neglected. This is probably one of the main reasons why, even after its several decades of development, there is still a lack of consensus about the process of market segmentation (see section 2.1.3). *Thirdly*, using the ***STP*** model, it is difficult to explain why some segmentation projects are successful while others are not. However, with the help of the ***PFA*** model it is possible to do so (see section 6.4.2 for discussion). *Fourthly*, while the ***STP*** model only suggests a list of procedures for conducting a segmentation project, the ***PFA*** model proposes three different levels of looking at market segmentation implementation. These are the segmentation activity level, the critical success factor level and the ***PFA*** stage level. The managerial implications of looking at market segmentation from the three different levels will be further discussed in section 7.3.1.

6.5 Summary

> *"The right analysis can reveal surprising market truths hidden within otherwise routine research data."*
>
> *(Morton 1990: 62)*

This chapter started with a reverse check of the relationships between the ten factors and segmentation success. The 86 cases were divided into "unsuccessful" and "successful" groups. *Student's t* tests were then used to investigate the differences between the two groups. It was found that some factors were both *sufficient* and *necessary* conditions for segmentation success. Other factors were found to be *sufficient* but were not *necessary* conditions for segmentation success.

In addition, the reverse check led to the identification of the ***plan***, ***fieldwork*** and ***action*** stages in the segmentation process. Using factors in each of the three stages as entry variables for cluster analysis, the 86 cases were grouped into different clusters. Names were given to the clusters based on their characteristics. It was found that when it comes to distinguishing successful segmentation projects from unsuccessful ones, it is the *plan* and *action* stages that matter most. They are the two stages that a company has to deal with particularly carefully, if it is to succeed in conducting a segmentation project.

Based on the three stages and the clustering of the 86 cases, the ***PFA*** model was developed. The mechanism of the model clearly shows the relationship between the three stages and segmentation success. Using Venn diagrams as an alternative presentation tool, the research shows the route up to the segmentation summit and the crevasses down towards the segmentation black hole. In addition, the association of the ***PFA*** model with Bayes' theorem shows a promising future for using the model in diagnosing segmentation troubles. Lastly, the differences between the ***PFA*** and the ***STP*** models were discussed.

7. Conclusion

7.1 Summary of the Research
7.2 Contributions
7.3 Managerial Implications
7.4 Critiques
7.5 Suggestions for Further Research
7.6 Epilogue

As discussed in Chapter One, the purpose of the research was to investigate the factors that impact upon the success of market segmentation implementation. This chapter summarises the findings from the research, discusses the research contributions and the implications of the findings, and critically assesses the methodology. Suggestions for further research are also provided.

7.1 Summary of the Research

> *"The successful implementation of a segmentation strategy requires attention to certain issues ... The astute business marketing strategist must plan, coordinate and monitor implementation details."*
>
> *(Hutt & Speh 1995: 182)*

This research was an exploratory study of the factors critical to successful segmentation implementation. Very few published studies provide empirical evidence about the factors that impact on segmentation success. Also, existing research has been unable to explain why some segmentation projects are successful and others are not. This research helps to fill the gap in the literature by illustrating the development of a methodology designed for identifying the critical success factors in a segmentation project and by developing the *plan*, *fieldwork* and *action* (***PFA***) model for explaining the reasons for segmentation success.

This research began with a review of the literature to generate an initial list of success factors related to segmentation implementation. Then, twelve pilot interviews were conducted to build a better understanding of the general practice of segmentation in the business world. The interviews helped to integrate industrial experience and knowledge from the literature. The interviews also helped with the identification of more success factors for implementing segmentation projects. Next, a structured questionnaire was developed. Six hundred questionnaires were delivered at eight trade shows at the Birmingham National Exhibition Centre (NEC). 242 responses were collected. 86 of these were fully completed.

By using factor analysis, ten factors relating to successful segmentation were extracted. Positive relationships between the factors and the success of segmentation projects were hypothesised and tested. Using the factor mean as the cutting point, the 86 responses were divided into two categories (*lower-half* and *upper-half*). Seven out of the ten factors showed significant differences between the two categories. These seven factors were labelled *critical success factors* for segmentation because they were the factors that segmentation success seemed to rely upon.

In addition to the CSFs which were identified, the research went a step further to develop the ***PFA*** model which can be used to explain why some segmentation projects are successful while others are not. Using factors in each of the *plan*, *fieldwork* and *action* stages as entry variables, cluster analysis divided the 86 cases into two groups in each stage. Investigation of the characteristics of these clusters showed they can be labelled as *strongly-oriented* and *weakly-oriented* groups. It was found that the *strongly-oriented* groups in any of the *plan*, *fieldwork* and *action* stages perform better than their *weakly-oriented* counterparts. Using changes of success rates, the ***PFA*** model showed how the success of a segmentation project can be explained.

7.2 Contributions

"If I have seen further it is by standing on the shoulders of giants."

(Isaac Newton, 5th February 1675, in a letter to Robert Hooke)

This research makes several contributions to the literature on the identification of CSFs for segmentation success, the development of the ***PFA*** model, and the way in which multivariate analysis is used.

7.2.1 Identification of CSFs for Segmentation Success

The first contribution of the research is the identification of the CSFs for segmentation success. The investigation of the relationships between CSFs and segmentation success adds to our understanding of the influential variables. This knowledge can assist managers in taking appropriate action to make the best use of segmentation to their companies' advantage. The managerial implications of the research findings will be further discussed in section 7.3.

7.2.2 Development of the *PFA* Model

The development of the ***PFA*** model represents a major contribution to the literature for a number of reasons. These include: (1) the production of a new way of looking at market segmentation, (2) offering an estimation of the impact of each stage (*plan*, *fieldwork* and *action)* upon market segmentation success, (3) the presentation of a tool for explaining and predicting market segmentation success, and (4) the provision of a method of control over independent variables.

First, most of the segmentation literature assumes that there are three steps in a segmentation project. These are *segmenting*, *targeting* and *positioning* (***STP*** marketing). No research has explicitly looked at market segmentation from the *plan*, *fieldwork* and *action* perspectives. This research has developed the ***PFA*** model and demonstrated the impacts of the *plan*, *fieldwork* and *action* stages upon segmentation success. The presentation of the ***PFA*** model not only provides a

new framework for academics to understand better the nature of segmentation success, but also opens a new door for further research into such issues. (The differences between the ***PFA*** and the ***STP*** models have already been discussed in section 6.4.6).

Secondly, Weinstein (1987: 37) argues that the most important factor in determining whether a segmentation study will provide the desired results is the planning and research framework. Others might think that fieldwork or action is the most important. However, little research has been done to provide empirical evidence as to how important the different stages are to segmentation success. Consequently, apart from an intuitive feeling that these stages are important to segmentation success, we have little understanding of the relative importance of each stage in the whole market segmentation process.

The ***PFA*** model has provided a conceptual framework for estimating the impact of each stage upon segmentation success. So, not only can we see that differences exist between the *weakly-oriented* and *strongly-oriented* groups at each stage but we also know the size of the differences. These findings give marketing scholars and practitioners more accurate ideas beyond mere intuition for emphasising the importance of each stage in a segmentation project.

Thirdly, allied to the second contribution, this model can explain, and presumably, predict the success/failure of a segmentation project. Figure 6-8 helps visualise the impacts of the *plan*, *fieldwork* and *action* stages on segmentation success. This contribution can be viewed as the function of a distillation column in a refinery. *Distillation* is a technique of separation which makes use of the difference in volatility or boiling point of different components in a mixture (Waddams 1962: 11-12). A distillation column contains a series of horizontal perforated plates inside. Its function is to carry away the most volatile components of the mixture, such as gas and liquefied gas, in the vapour phase from the top of the column, and to draw off the least volatile components, such as bitumen and coke, from the bottom. By using the three stages, the ***PFA*** model

helps *distil* segmentation projects into eight distinct groups. The implications of the model could be many and will be discussed in section 7.3.

Lastly, it is hard in social science to do *experimental research* because it is difficult to control the independent variables. With the help of the ***PFA*** model the research has revealed the hidden structure of real-world cases. That is, the *plan*, *fieldwork* and *action* stages in a segmentation project. So, although a study may still be non-experimental in nature, by using the ***PFA*** model, it is possible for the researcher to *fix* the status of one stage and investigate the impact of other stages on segmentation success. The ***PFA*** model, thus, provides a new way for researchers to manipulate independent variables in their segmentation studies.

7.2.3 Imaginative Use of Analytical Techniques

Saunders (1994: 27) contends that cluster analysis is like a lens whose focal length can be changed to show completely different pictures of the same scene, or like a range of pictures taken using different wavelengths: x-ray, infra-red, and ultra-violet, as well as visible light. Indeed, cluster analysis is a powerful tool for exploring the nature of a data set. However, not all studies have demonstrated the use of cluster analysis in a clear and easy-to-understand way (e.g., McDougall & Robinson 1990). In other words, the clusters generated in these studies do not really have *homogeneous within* and *heterogeneous between* characteristics.

One of the reasons is that the data studied may not bear a clear structure in the first instance. Under these circumstances, even with the help of sophisticated statistical techniques, there is not much a researcher can do. Another significant reason is what Aldenderfer and Blashfield (1984: 20) describe as a form of *naive empiricism*. That is, using as many variables as possible in the cluster analysis with the hope that a *structure* will emerge if only enough data are obtained. For these two reasons, a cluster analysis may not yield solutions that divide cases into distinct groups according to their attributes.

This study, by combining the use of factor analysis, cluster analysis, *Student's t* test and cross tabulation, and most importantly, by carefully choosing the entry variables for cluster analysis (see section 3.5.2.1 & section 6.2.1 for discussion), has clearly shown how these statistical techniques can be used to explore fully the multifaceted characteristics of a data set. This approach for using statistical techniques sets a good example for future researchers and can be applied to many fields of marketing, management, and probably also to different disciplines (see section 7.5.1 for further discussion).

7.3 Managerial Implications

> *"Interesting findings are not important unless they can be used for marketing planning, implementation and controlling."*
>
> *(Weinstein 1987: 57)*

The findings from this research provide a number of implications for marketing managers in their segmentation projects. Although this study was limited to the eight trade shows at the NEC, Birmingham, UK, insights obtained on the relationships between the CSFs and market segmentation success may have similar implications for other industries and other countries as well. These implications include: (1) areas for special attention, (2) closely related stages, (3) the importance of action, (4) upstream segmentation (5) the segmentation training programme and (6) tools for consultancy.

7.3.1 Areas for Special Attention

Using the CSF approach, the research findings have highlighted areas critical to segmentation success on which management should focus. These areas can be considered at three different levels. They are the segmentation activity level, the critical success factor level and the ***PFA*** stage level.

First, the identified thirty one segmentation activities offer companies a sequential checklist which enables management to track the segmentation project

through each stage of its implementation process. This list is by no means exhaustive. Nor is it meant to be foolproof. It may not suit segmentation situations in every company. However, substitute activities which are unique to specific companies or industries can be modified and the list can serve as an initial guide for managers in their segmentation implementation.

Secondly, the ten factors extracted from the thirty one segmentation activities give management an idea of the areas important to segmentation practice. Of the ten factors, seven are critical to the success of a segmentation project and are termed CSFs of segmentation success. In addition, four of the seven CSFs are found to be exclusively possessed by successful segmentation projects (see section 6.1.1). They are factor 1: *quality results*, factor 2: *action on results*, factor 3: *management support* and factor 9: *morale and communication.* The four CSFs are the *sufficient* and *necessary* conditions for segmentation success and are termed *ECSFs* (especially critical success factors). Management should pay attention to these seven CSFs, particularly the four ECSFs, if the segmentation project is to be successful.

It is important to point out here that the identification of the CSFs does not necessarily mean that management must cover every aspect of the factors. The identified seven CSFs (and the four ECSFs) may still be too many for companies to focus on in detail. It is possible that concentrating on one or two critical factors may be enough for a company to make the first step towards segmentation success. Another consideration is that even if a company does this, success cannot be guaranteed. However, understanding the CSFs should help marketers better develop, execute and monitor the whole segmentation process which may increase their chances of success.

Thirdly, the three *plan*, *fieldwork* and *action* stages present a model for management to achieve a panoramic view of a segmentation project. As discussed in section 6.4, the purpose of a model is to represent the relationships between or among concepts in an abstract manner so that we can understand more easily how

a system or process works, or how it might work (Anderson *et al.* 1991: 6; Collins Dictionary 1987: 929; Rigby 1965: 112). The ***PFA*** model is a simplified representation of a complicated segmentation process. It allows easier analysis of segmentation problems by ignoring trivial details and things that are not directly relevant to segmentation implementation. The ***PFA*** model presents a concise framework for management to review a company's strength and weakness in terms of the *plan*, *fieldwork* and *action* stages so that measures can be taken to direct an organisation's efforts towards more successful segmentation implementation.

7.3.2 Closely Related Stages

The mechanism of the ***PFA*** model has shown the extent to which the *plan*, *fieldwork* and *action* stages may be responsible for segmentation success. The success rate differences between the *weakly-oriented* and *strongly-oriented* groups in the three stages are 41%, 23.8% and 68% respectively (see section 6.4.2). Of the three stages, *action* is probably the most important as it has the greatest impact on segmentation success. Management should, therefore, pay special attention to *action* (see further discussion in the next section).

This research has also revealed the combined impacts of the three stages on segmentation success (see Figures 6-7, 6-8, 6-11 & 6-12). For segmentation strategy to be really successful, it must be an integrated project of the three stages. It cannot be guaranteed that any company carefully going through these stages will automatically succeed. However, a comparison of the success rate of $\boldsymbol{P_w}$-$\boldsymbol{F_w}$-$\boldsymbol{A_w}$ (0%) and that of $\boldsymbol{P_s}$-$\boldsymbol{F_s}$-$\boldsymbol{A_s}$ (90.9%), makes it obvious only projects which are *strongly-oriented* in ***all three*** stages will have the best chance to succeed.

7.3.3 The Importance of *Action*

Even if the *plan* and *fieldwork* stages have been done well, there is little benefit if the results from the segmentation project are not well implemented, or not put into action at all. Marketing implementation, according to Kotler *et al.*

(1996: 102) is the process that turns marketing strategies and plans into marketing actions to accomplish strategic marketing objectives.

Very often it is easier to develop good marketing plans than it is to carry them out. Action involves day-to-day, month-to-month activities that effectively put the marketing plan to work. It requires that the findings from a segmentation project be transmitted to the people in the organisation who will carry it out. Kotler *et al.* (1996: 105-108) suggest that successful implementation depends on how well a company blends five elements - action programmes, organisation structure, a decision-and-reward system, human resources, and company culture - into a cohesive programme that supports its strategies.

Of course, there may be occasions when the results should not be put into practice. *First*, the project results may show that adopting a segmentation strategy is not a promising solution. Hence, action may not be worthwhile. *Secondly*, company resources may be tight so the necessary investment cannot be resourced. *Thirdly*, the market may have changed when the results come out.

During the empirical survey stage of the research, it was found that in many unsuccessful segmentation projects the research results were regarded as an end in their own right. The results were not carried to the subsequent stage of using them for resource allocation, and hence the project was not successful. The ***PFA*** model has clearly shown that *action* is the most important stage in the segmentation process. Therefore, findings from a segmentation project should not be treated as *for reference only*. As Plank (1985: 90) contends, a good strategic segmentation plan is only as good as the ability of the firm to implement it. Management must have the courage to put findings into practice, even though there are risks involved.

7.3.4 Upstream Segmentation

Dibb and Simkin (1994: 57) claim that, although academics stress the need to identify the most suitable and statistically valid segmentation schemes, the

priority of the practitioner is to identify segments for which an effective marketing programme can be developed. As discussed in section 6.3.3, companies may follow the *upstream* route in their segmentation projects. That is, they start with *action*, get some results, decide to do more *fieldwork* to get sufficient information for decision making, and only then realise the need for a *plan* to assist gathering data systematically. The *upstream segmentation* implementation is not uncommon in day-to-day business operations. For example, Foote (1969: 29) finds marketing managers who have very successfully employed segmentation strategy without the resources of detailed information that many professional marketers think are indispensable to decision-making in today's complex and risky business world.

The *upstream segmentation* concept developed in this research implies that a company does not have to wait until all the necessary market information is gathered before it can put segmentation into practice. For many companies, a small amount of information plus some experience and judgement may be more than enough for taking the first step towards segmentation action.

7.3.5 The Segmentation Training Programme

Training has long been regarded as an important ingredient of company and industry competitiveness (e.g., Stevens & Walsh 1991). *Training* is the process of learning the skills that one needs for a particular job or activity (Collins Dictionary 1987: 1553). From a company perspective, the aim of training is to help create and maintain a sufficient supply of trained manpower to meet the demands of the present and the foreseeable future (Hacon 1961: 161).

As shown in Table A7-11 (see Appendix 7), the strong association between segmentation knowledge and segmentation success indicates the value of segmentation training in a company. The fact that this research failed to identify training as one of the CSFs of segmentation success in both literature review and

pilot interviews implies that this is probably an area overlooked by both academics and practitioners (Dibb & Simkin 1996: 3).

The results shown in Table A7-11, combined with the fact that not many people seem to appreciate the benefits and practice of segmentation (see Table 5-8), have two managerial implications. *First*, having a training programme to raise company staff's knowledge level of segmentation should be a good investment. *Secondly*, an effective training programme should lead to a better chance of segmentation success.

The effectiveness of a training programme, however, rests on several requirements (Koontz & Weihrich 1988: 364-365). For example, the support of top management is essential. Also, it is important to involve people from different levels of the company who will be charged with the implementation of a segmentation strategy. In addition, training is not just for a selected few, nor is it only for those at lower levels. Top management may recognise the training needs of first-line supervisors but not their own. They, also, should be trained as well, to provide an example of their commitment to the adopting of segmentation strategy, as well as keeping them up to date. While it is beyond the scope of this research to discuss training programmes in depth, a detailed exploration of this issue can be found in Craig (1987).

7.3.6 Tools for Consultancy

One of management's daily responsibilities is to solve problems. Managers spend the majority of their working hours and energy on identifying and analysing problems, and finding solutions. Most problems in a company are identified and handled routinely by managerial and specialist staff. However, there are problems which management do not really know how to deal with and would like to tackle with the help of a consultancy (Kubr 1993: 53). According to Steele (1975: 2-3), *consulting* means any form of providing help on the content, process, or structure

of a task or series of tasks, where the consultant is not actually responsible for doing the task itself but is helping those who are.

Certain segmentation practices, such as dividing a market by some specific bases, are still considered difficult (e.g., Cheron & Kleinschmidt 1985: 102). As a result, there are hundreds of consultancy companies offering many types of market segmentation services for all types of business and industries (Weinstein 1994: 295-303). For those consulting companies, findings from this research should offer valuable insights into the nature of successful segmentation projects.

The ***PFA*** model gives those consulting companies a tool for analysing the complex nature of segmentation projects. For example, while diagnosing an unsuccessful segmentation project, the model suggests that the chances for the project to be *weakly-oriented* in each of the *plan*, *fieldwork* and *action* stages are 74.2%, 64.5% and 58.1% respectively (see Table 6-27). Although the ***PFA*** model cannot pinpoint the problems which may exist in a segmentation project, these statistics provide consultancies with the basis for finding possible deficiency in a segmentation project so that sound recommendations for improving segmentation practices can be made.

7.4 Critiques

> *"... we have never done a study that was not flawed in some way, we are not surprised that this study has flaws."*
>
> *(Armstrong & Brodie 1994: 92)*

A number of biases resulting from the limitations of the research have already been discussed in section 4.7. These include: *post hoc*, cross-sectional, non-responses, non-sampling and non-experimental biases. At this stage, although there should be no need to reiterate those areas, it is useful to provide some other limitations which might be useful for future work's reference.

7.4.1 Causal Inference

The research questions suggested a cause-effect relationship between the independent and dependent variables. If the causes of the effects (segmentation success) can be understood, our ability both to predict and to control these effects will be greatly improved. However, this research is basically of a *post hoc* cross-sectional design (see section 4.7.1 & section 4.7.2). The research design had no control over all the independent variables established in this study. Therefore, the conclusions that could be supported by statistical results were held to be the probability of the existence of real relationships between the independent and dependent variables.

Green *et al.* (1988: 107) suggest three types of evidences to help draw inferences about causal relationships between independent and dependent variables in a research. These are: associative variation, sequence of events, and absence of other possible causal factors.

One type of associative variation is "association between the changes of two variables" - a measure of the extent to which a change in the level of one variable is associated with a change in the level of the other. To obtain evidence concerning this relationship, hypotheses between independent and dependent variables can be formulated and tested. In this research the associative variation was checked by comparing the success scores of the *lower-half* and the *upper-half* responses in each factor. It was found that significant differences exist between the two groups in many CSFs, indicating these CSFs *seem* to be factors in determining segmentation success.

A *second* characteristic of a causal relationship is the requirement that the causal factor occurs first. That is, to infer p causes q, it must be true that p happens before q. In this research, in order for the CSFs to be responsible for the segmentation success, the CSFs must have taken place prior to the segmentation success, which is the case in this study. For example, if one is to judge the

success of a specific segmentation project in his company, the project must have been done already. Theoretically, the project should have already gone through the *plan*, *fieldwork* and *action* stages (although not necessarily all of the stages as in the case of *upstream segmentation* - see section 6.3.2) and come out with some results. Otherwise it is still an ongoing study and there are no results on which the judgement can be based.

A *third* basis for inferring causation is the absence of any possible causal factors other than the one or ones being investigated. If no other factors could be demonstrated to have caused the segmentation success, it could then be concluded that the CSFs must have been responsible. In this research, company demographics were treated as extraneous variables and their possible interventions to the hypothesised independent and dependent relationships were checked (see section 6.4.3). It was found that no intervention existed.

In fact, as Green *et al.* (1988: 109) argue, "*No one of the three types of evidence, nor, indeed, all three types combined, can ever demonstrate conclusively that a causal relationship exists.*" Even if one can satisfy the three above conditions, it is still not possible to be a hundred percent sure about the causal relationship. This is a limitation embedded in all *post hoc* cross-sectional research designs.

Owing to its non-experimental nature, it is impossible for this research to rule out clearly all extraneous factors and conclude that there are no other factors that would account for the success of a specific segmentation project. However, piecing together all the evidence in this research, it would be difficult to avoid the conclusion that some kind of cause-and-effect relationship does exist. The accumulation of evidence from various tests in this research gave the researcher reasonable confidence to infer that causal relationship ***seems*** to exist between the CSFs and market segmentation success.

7.4.2 Uni-Dimensional Construct of Success

Owing to its exploratory nature, this research focused on only one aspect of market segmentation success. That is, segmentation success was measured by the subjective judgements of the respondents alone. With a complex concept like *market segmentation* (see section 2.1.2), one item is unlikely to be enough for accurate measurement. Moreover, *success*, an even more complicated notion (see section 2.3.1), should be considered as more multi-dimensional. The way of treating *market segmentation success*, a combination of two intricate terms, as uni-dimensional in this research may result in potential bias in the findings.

For the sake of future research, perhaps it is suitable for this research, finally, to take into account all of the empirical evidence gathered (see section 5.2.8) and give successful segmentation the following definition:

> ***Successful market segmentation*** *is a market segmentation project the results of which provide clear guidance for marketing actions and hence lead to the company's better identification of customers and allocation of its resources so that customers' needs in the targeted market are more effectively served.*

This definition may be hardly satisfactory and much more work needs to be done to operationalise the concept of segmentation success and to develop a more accurate instrument for measuring this fundamental concept in market segmentation research. However, with little literature available which relates to segmentation success and its measurement, this research has at least made a start in developing an instrument for measuring market segmentation success.

7.4.3 Small Sample Size

Although the research collected 221 usable questionnaires, only 86 were fully completed and therefore used for developing the ***PFA*** model. In the ***PFA*** model, the 86 cases were divided into two groups in each of the *plan*, *fieldwork* and *action* stages. The impact of the three stages on segmentation success was

then calculated. If a larger sample had been obtained, it might have been possible to divide the cases into three or even four groups in each of the three stages. By doing so, the impact of each stage to segmentation success could have been more precisely measured. However, owing to the small sample size this research was unable to do so fine-tuned a job. This task will have to be left for future research.

7.5 Suggestions for Further Research

> *"... a great deal more work needs to be done before ... marketing practitioners will have a normative model of ... market segmentation they can utilize with any great degree of confidence."*
>
> *(Plank 1985: 90)*

So far, this research has unveiled some secrets of segmentation success. However, much remains unknown. A research agenda, hence, is proposed for extending the findings from this research. Of the many suggestions for further research, the first two are concerned with research implications and others relate to the areas where improvements could be made.

7.5.1 Using Multivariate Statistics

> *"... by rearranging and transforming basic correlations, factor analysis gives to the researcher a classification of variables. This classification or clustering is supposed to trigger the researcher's imagination to put the surplus meaning in the data."*
>
> *(Sheth & Armstrong 1969: 139)*

As far as statistical techniques are concerned, the most interesting possibilities relate to the application of the approach used to analyse data. This research has applied multivariate statistics in ways which resulted in clear and distinct outcomes. The 86 segmentation projects in this research can be likened to customers in a market in several respects. All projects have different attributes with respect to *plan*, *fieldwork* and *action*. Each one of them behaves differently.

Some are successful and others are unsuccessful. Also, using certain criteria, they can be categorised into different groups, such as *plan weakly-oriented* and *plan strongly-oriented.*

This demonstration has a lot of potential for researchers. It is possible that the method of using statistical techniques in this research can be applied to different marketing fields, such as new product development and advertising, or even to research in different disciplines.

In fact, the use of factor analysis and cluster analysis is very popular in the marketing literature (e.g., Easingwood & Storey 1991; Fader & Lodish 1990; McDougall & Robinson 1990). However, not all of these studies produce convincing and easy-to-understand results (see section 7.2.3 for discussion). Therefore, although the literature review can provide a useful path to follow, researchers should try different ways of using statistical methods and look at the findings from various angles (Wind 1978b: 332). After all, what is the purpose of doing research if one contributes nothing new but follows the steps of his or her predecessors?

7.5.2 Interpreting Research Findings

It would be a shame if research findings cannot be expressed in a way which is easily understood. This research used several simple tools to interpret the research findings, and provide clear and concise results. For example, with the help of Venn diagrams and Bayes' theorem (see section 6.4.4 & section 6.4.5), the research was able to explain the impact of the ***PFA*** model in a number of straightforward ways. This demonstration of different approaches for interpreting findings should be a good example for fellow researchers to adopt.

7.5.3 Other CSFs

This research has identified seven CSFs for segmentation success. However, there may be other factors that can affect segmentation success and

which have not been identified in the present research. For example, it was found that the degree to which management understands segmentation concepts has considerable impact on the segmentation implementation. This finding suggests that segmentation education and training may also be one of the CSFs and hence should be included in a further study. Moreover, as Rockart suggested (1979: 86), some CSFs are applicable to any company in any industry and some differ from company-to-company and from manager-to-manager. Therefore, more research is needed to unfold those CSFs which were not identified in this study.

7.5.4 Different Industry Settings

This research has included samples from eight industries, concluded seven CSFs and developed the ***PFA*** model for segmentation success. Although it is reasonable to infer that many companies and industries are going to find that they have in common the CSFs identified in this research, it is possible to identify other CSFs that might be unique to a specific company or industry. In addition, the relative importance of factors may be different from industry to industry, or from company to company. More research will be needed so as to broaden and generalise the results of the research to other industries, or to industries in different countries.

As for the ***PFA*** model, although it showed its power for explaining segmentation success in this research, it will have to be tested many times in different settings and with different populations before it can be elevated to the status of a theory which can be comfortably used by academics and practitioners to explain and predict the success of a segmentation project.

7.5.5 Measurement of Segmentation Success

Wind (1978b: 333) argues that "The most difficult aspect of any segmentation project is the translation of the study results into marketing strategy." Lin and Dibb (1994: 7) propose that the main reason for this difficulty may be the lack of a scale to measure the success of segmentation projects.

Without an adequate measurement, marketers, obviously, have no way of knowing how well they have done and how far they have gone in the foregoing translation process.

It is acknowledged that there may not be a scale which can be adopted universally to measure segmentation success. Nevertheless, one which can be broadly accepted as a *quasi-standard* by academics and practitioners is urgently needed if a breakthrough is to be made in translating the results of segmentation projects into a strategy.

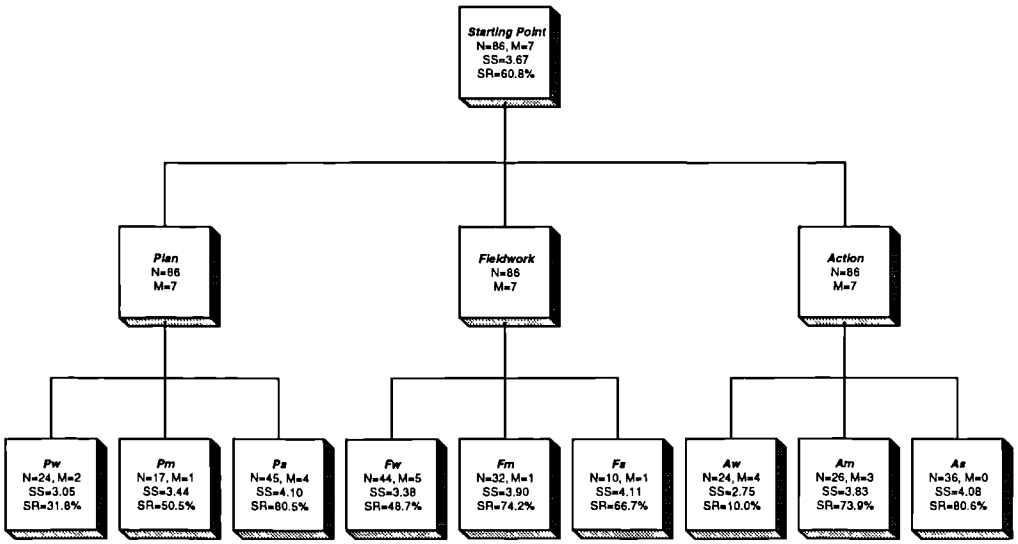
As discussed in section 7.4.2, owing to its exploratory nature, this research adopted a uni-dimensional approach for measuring segmentation success. It is acknowledged that the instrument was rough. Nonetheless, it has provided a benchmark for future research. Future work should look at a wider range of measures of success. Generally accepted ideas of the indicators of a successful segmentation, such as increased sales, better company image, and better understanding of customers' needs have to be translated into specific measures of segmentation success. For this purpose, comments from the respondents in this research about the measure of segmentation success (see Table 5-20) can be used as a base for developing a more precise instrument for measuring segmentation success.

7.5.6 Larger Sample Size

The sample size in this research was just enough for the development of the ***PFA*** model in which each of the *plan*, *fieldwork* and *action* stages was divided into two groups and their impacts on segmentation success measured. With a larger sample size, it would be possible to divide cases into three groups, as shown in Figure 7-1 and Figure 7-2, and then to measure more accurately the impact of each stage on segmentation success. So, this research has achieved the first task, that of roughly estimating the impact of each stage on segmentation success, and

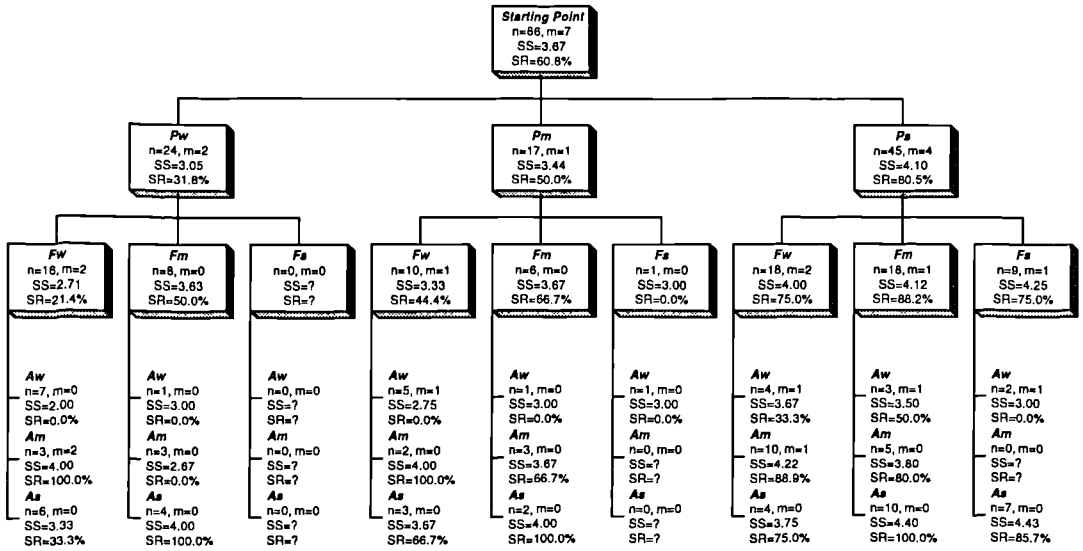
leaves the challenge of fine-tuning the ***PFA*** model to a higher level of precision to our future work and that of fellow researchers.

In addition, the research samples were drawn from eight trade shows at the NEC. As discussed in section 4.7.3, according to Faria and Dickinson (1986: 152), companies with moderate market share and those with five or more product lines are less likely to consider trade shows as important. As a result, these companies may be less likely to be included in the samples of the research. It is possible that had the research focused its attention on these companies, the results would be totally different. It would be interesting to know if findings from this research still hold in these companies. A cross-populational investigation of this issue, therefore, could enhance our understanding of critical factors related to segmentation success.



N: Sample size
M: Missing success score
SS: Success score
SR: Success rate

Figure 7-1 A More Detailed Look at the *PFA* Model



n: Sample size
m: Missing success score
SS: Success score
SR: Success rate

Figure 7-2 A More Detailed Look at *PFA* Stages

7.5.7 Longitudinal Research Design

As Rockart states (1979: 87), "Any organization's situation will change from time to time, and factors that are dealt with by executives as commonplace at one time may become critical success factors at another time." The CSFs of any company, and presumably any industry as well, will change in time.

Owing to its resource constraints, this research adopted a *post hoc* cross-sectional method when investigating factors critical to market segmentation success. The inherent weaknesses of this approach, such as relying on human memory, largely detract from the reliability of the data collected and reduce the ability of the research to generalise about the full spectrum of market segmentation CSFs. Although this is a common limitation shared by most studies of the same research design, future work may wish to take into account the "time" dimension of CSFs and adopt a longitudinal approach.

Using a longitudinal research design, it is possible to measure the success of each of the *plan*, *fieldwork* and *action* stages and then the success of the

segmentation project as a whole. By so doing, a research will be in a better position to grip the dynamic nature of CSFs and provide better insights into CSFs for market segmentation.

7.5.8 Measurement of *PFA* Stages

This research has identified the *plan*, *fieldwork* and *action* stages in the process of market segmentation implementation. At the outset of the study, however, the researcher could not foresee the three stages and did not take them into consideration in the development of the questionnaire. Having the ***PFA*** stages in mind, it would be possible, and should be interesting, for further research to develop a more precise instrument for measuring the performance of these stages in a segmentation project.

7.5.9 The Effects of Success on the *PFA* Stages

In section 6.4.1, this research argued that the success from a segmentation project would have impact on the later projects. During the validating interviews, it was found that successful experience of segmentation did have impact on further practice of the three ***PFA*** stages. However, the size of that impact is not clear. Does the impact really exist at all? Further research on these issues could produce fruitful insights into our understanding of market segmentation implementation.

7.5.10 PLC Concept and Market Segmentation

In section 5.2.5.2, this research made a new attempt to investigate the relationships between segmentation practices and the *product life cycle* (PLC) concept. It was found that most of the segmentation projects (39.7%) were carried out for products in their *mature* stage, with 20.5% for the *very new* and 29.5% for the *young*. Only 5.1% of the projects were launched for *ageing* products.

Cravens *et al.* (1976: 243) suggest that in the different PLC stages firms should concentrate on segmenting markets with different bases. In addition, Robertson and Barich (1992: 9) claim that as the market matures, there are fewer and fewer first-time buyers. Therefore, marketing actions must reflect the change of the market. For further research, how segmentation strategy can be used in the different PLC stages should be an interesting topic.

7.5.11 Fuzzy Clusters

In section 6.4.4, this research adopted Venn diagrams, a traditional tool for dealing with nonfuzzy sets (*crisp sets*) problems, to investigate the interrelationships amongst the *plan*, *fieldwork* and *action* stages. Although the dendrograms in Figures 6-1 to 6-3 clearly identified two clusters in each of the *plan*, *fieldwork* and *action* stages, the scatter diagram (Figure 6-13) showed that there were in fact fuzzy boundaries between the *weakly-oriented* and *strongly-oriented* groups in the ***PFA*** stages. This finding implies that more advanced tools, such as fuzzy sets theory and neural network may be helpful to draw clearer boundaries between the different groups in each of the ***PFA*** stages.

Indeed, there have been some researchers (e.g., Dasgupta *et al.* 1994) who have used the neural network method in dealing with market segmentation issues. The adoption of the new methods seems to have much potential. It would be interesting to see more researchers using these new techniques in tackling market segmentation issues.

7.6 Epilogue

Now, it is about time to draw the story to a close. In essence, this is exploratory research about the CSFs of successful market segmentation. Through the literature review, the pilot interviews and the collected questionnaire data, many factors believed to be critical to segmentation success have been identified. At that stage, the researcher thought the story had ended.

But then, after much thinking, new ideas evolved. Why not do a reverse check? How can the questionnaire responses be categorised? What are the characteristics of each response group? Are there differences between the many groups of responses? Can the characteristics and differences of each group be summarised so that one can easily understand all the complexity? ... These thoughts lingered and so the research went on and on. After months of painstaking work, the efforts eventually led to the presentation of the ***PFA*** model. The researcher can still remember clearly the excitement as one after another of the ideas about the construct of the model held up during the analysis.

So, the research is complete, but what is the key to market segmentation success? It seems that we still do not know for sure. This research provides only partial answers to the question[1], and does not lead to a formula for absolute market segmentation success. However, these findings move us a step closer to the answer.

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[1] A summary of the compiled main research findings sent to questionnaire respondents is seen in Appendix 8.

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Appendix 1. Pilot Interview Checklist

General Questions:

1. How many employees are there in your company?
2. What business is your company in?

Segmentation Implementation:

3. What type of customers are there in the market?
4. How does your company group customers?
5. How does your company choose customers?
6. How does your company find customers' needs?
7. Has your company ever done research on finding what the customers' needs are? How?
8. How successful do you consider this research to be? Why was it successful, or unsuccessful?
9. How useful were the research findings? In what way were they useful?
10. How are the marketing research outcomes used in your company?
11. Do your competitors group customers in the same way?

Segmentation Concepts:

12. If I say *market segmentation*, what does it mean to you?
13. How important do you think segmentation is to your company? In what way do you think it is beneficial to your company?
14. Do you think market segmentation is a concept which is well understood in your industry?
15. In your opinion, what makes a segmentation research project successful?

Marketing mix:

16. How are your company's products positioned in the market place?
17. Does price vary for different customer groups?
18. How does your company promote products?
19. How is the distribution channel organised in the market?
20. In general, how good do you think your company is at meeting the customers' needs?

Appendix 2. The Interview Contact Letter

Contact Company

Date

Dear (Contact Person)

I am a doctoral student at Warwick Business School, undertaking research into the topic of market segmentation. I am writing in the hope that you may be of assistance to me in this research.

It is my objective to examine the key success factors in planning and implementing market segmentation. At this stage I am particularly keen to discuss these issues with industrial experts in order to generate some ideas for the research.

I should be grateful if you would allow me the opportunity to outline this research to you in more detail and ask for your opinions about this area. I realise that confidentiality is of the utmost importance to your company. I shall always treat any information from the interview with great care.

To this end, I will telephone you during the week beginning the 31st of January, 1994. I look forward to speaking with you.

With kind regards

Yours sincerely

Tom M. Y. Lin

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Appendix 3. A 'Thank-you' Letter

Contact Company

Date

Dear (Contact Person)

Thank you for spending the time with me for the interview related to my market segmentation research. Your comments have been especially helpful as they have greatly helped me to focus the research topic at this early stage of my study. As you agreed would be acceptable, I will contact you again if more information is needed.

Once again, thank you for your generosity and help.

Yours sincerely

Tom M. Y. Lin

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Appendix 4. The Questionnaire

Strictly Confidential!

Warwick Business School
1994 Segmentation Survey

The aim of this questionnaire is to examine how companies segment their markets and to discover the factors that affect the success of a segmentation project. Your contribution to this survey would be very much appreciated. All replies will be treated in the strictest confidence. Please answer all questions by ticking (✓) in the appropriate box (❑), or by writing in the space provided. Instructions to skip questions are indicated by an arrow (➔).

The definitions in the box below may assist you in answering the questions.

Segmentation	refers to the process of: ***dividing*** a market into two or more groups of customers, each group containing customers with similar needs; ***selecting*** one or more of these groups as a company's target market; and then ***developing*** the company's products/services and related marketing activities to meet the needs of these selected markets.
Company	refers only to the immediate business in which you are working. Even if your company is part of a wider ***organisation***, the questions apply to ***your site*** only.

General information

1. For how many years has your company been operating?

   1❑ 5 or fewer
   2❑ 5 - fewer than 10
   3❑ 10 - fewer than 20
   4❑ 20 - fewer than 30
   5❑ 30 or more
   6❑ don't know

2. Approximately how many employees are there in your company?

   1❑ 20 or fewer
   2❑ 21 - 49
   3❑ 50 - 99
   4❑ 100 - 499
   5❑ 500 - 999
   6❑ 1,000 or more
   7❑ don't know

3. What is the main business activity of your company?

4. Is there a marketing/sales department in your company? (tick all that apply)

   1❑ marketing/sales combined
   2❑ marketing
   3❑ sales
   4❑ none of the above

5. Approximately how many employees are there in the marketing/sales department? (tick only the departments your company has)

Marketing / Sales combined	Marketing	Sales
1❑ 5 or fewer	1❑ 5 or fewer	1❑ 5 or fewer
2❑ 6 - 19	2❑ 6 - 19	2❑ 6 - 19
3❑ 20 - 49	3❑ 20 - 49	3❑ 20 - 49
4❑ 50 - 99	4❑ 50 - 99	4❑ 50 - 99
5❑ 100 or more	5❑ 100 or more	5❑ 100 or more
6❑ don't know	6❑ don't know	6❑ don't know

6. Approximately what was your company's turnover in 1993?

   1❑ under £1 million
   2❑ £1 - £9 million
   3❑ £10 - £49 million
   4❑ £50 - £99 million
   5❑ over £100 million
   6❑ don't know

7. Is your company:

1 ☐ mainly British owned

2 ☐ jointly British and foreign owned

3 ☐ mainly foreign owned
(please specify
owner's country)_____

8. Normally, your company obtains market and customer information from: (tick all that apply)

1 ☐ observation of markets by senior management

2 ☐ research/surveys by marketing people

3 ☐ information from sales force

4 ☐ information from dealers, distributors, and customers

5 ☐ outside consultancy organisations

6 ☐ trade fairs or exhibitions

7 ☐ published material, company reports, trade directories, etc.

8 ☐ other
(please specify) _____

9. Approximately how many customers does your company have?

1 ☐ 99 or fewer

2 ☐ 100 - 399

3 ☐ 400 - 999

4 ☐ 1,000 - 2,999

5 ☐ 3,000 or more

6 ☐ don't know

10. Approximately what proportion of the customers is your company in contact with more than once per month?

1 ☐ none

2 ☐ less than half

3 ☐ about half

4 ☐ more than half

5 ☐ almost all

6 ☐ don't know

11. Geographically, most of your company's customers are situated: (tick all that apply)

1 ☐ locally

2 ☐ in the UK

3 ☐ in Europe

4 ☐ throughout the world

5 ☐ don't know

12. What is your job title?

Segmentation in General

This section is to find out your views about segmentation in general. There are no right or wrong answers. Please answer all the questions.

Please say if you agree or disagree with the following statements.

13.	The ***main*** objectives for a segmentation project are to:	Strongly disagree	disagree	Neither disagree nor agree	agree	Strongly agree	Don't know
a.	understand customers' behaviour and needs	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
b.	understand market situations	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
c.	analyse competitors	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
d.	select the most suitable segments for the company to concentrate on	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
e.	facilitate the development of marketing plans	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐

13.	The ***main*** objectives for a segmentation project are to:	Strongly disagree	disagree	Neither disagree nor agree	agree	Strongly agree	Don't know
f.	maximise use of company resources	1❑	2❑	3❑	4❑	5❑	6❑
g.	select major product features to emphasise	1❑	2❑	3❑	4❑	5❑	6❑
h.	determine the price of a product	1❑	2❑	3❑	4❑	5❑	6❑
i.	develop an advertising campaign	1❑	2❑	3❑	4❑	5❑	6❑
j.	choose a distribution channel	1❑	2❑	3❑	4❑	5❑	6❑

14. In addition to the items in question **13**, can you think of any other reasons for conducting a segmentation project?

15. Of the above statements (**13.a. - 13.j. plus 14.**), which do you think are the ***three*** most important objectives for a segmentation project? Please put the appropriate letter of the statement in rank order below, with 1. being the most important.

1. (_____) 2. (_____) 3. (_____)

16. Do you think segmentation is beneficial to your company?

1❑ yes → **18.**

2❑ no → **17.**

3❑ don't know → **18.**

17. Segmentation is ***not*** beneficial to your company because: (tick all that apply)

1❑ your company has few customers

2❑ the market is very small

3❑ competition in the market is weak

4❑ segmentation doesn't really work

5❑ nobody in the company really knows what segmentation is about

6❑ other
(please specify) _____

18.	To what extent do you agree with the following statements?	Strongly disagree	disagree	Neither disagree nor agree	agree	Strongly agree	Don't know
a.	Segmentation concepts are well understood by ***the top management*** in your company	1❑	2❑	3❑	4❑	5❑	6❑
b.	Segmentation concepts are well understood by ***the marketing people*** in your company	1❑	2❑	3❑	4❑	5❑	6❑
c.	Segmentation concepts are well understood by ***the product designing people*** in your company	1❑	2❑	3❑	4❑	5❑	6❑
d.	Segmentation concepts are well understood in ***your industry***	1❑	2❑	3❑	4❑	5❑	6❑
e.	Segmentation concepts are widely ***adopted*** by ***companies in your industry*** in marketing planning	1❑	2❑	3❑	4❑	5❑	6❑

A Specific Segmentation Project

This section looks at the most recent market study containing a segmentation project which your company has undertaken (or any one in which you have been personally involved). Please answer the following questions ***only*** in the context of ***the segmentation part*** of this particular market study.

19. Has your company ever conducted a market study (marketing plan, market analysis, market audit, etc.) containing a segmentation project?

1❑ yes 2❑ no 3❑ don't know

20. Have you been involved in any market study containing a segmentation project?

1❑ yes 2❑ no

If **both** of the answers to questions **19** and **20** are "**no**" or "**don't know**", → question **34**; otherwise, → question **21**.

21. What were the main purposes of this market study?

22. Which product/service did this specific market study consider?

23. At the time of the research, how well-developed was this product/service in comparison with its market?

1❑ very new
2❑ young
3❑ mature
4❑ ageing
5❑ don't know

24. Who was involved in this market study? (tick all that apply)

1❑ marketing staff / sales force only
2❑ marketing staff / sales force in conjunction with people from different departments
3❑ chief executive officers
4❑ dealers, distributors and customers
5❑ outside consultancy organisations
6❑ other
(please specify) _____

25. Which of the groups of potential buyers for this specific product/service did your company serve?

1❑ only some of the customer groups
2❑ all of the different customer groups
3❑ don't know

26.	Still referring to the segmentation part of this market study, to what extent do you agree with the following statements about your company?	Strongly disagree	disagree	Neither disagree nor agree	agree	Strongly agree	Don't know
(1)	formal and agreed procedures were used for conducting the segmentation project	1❑	2❑	3❑	4❑	5❑	6❑
(2)	the project objectives were clearly defined	1❑	2❑	3❑	4❑	5❑	6❑
(3)	the importance of different objectives was agreed	1❑	2❑	3❑	4❑	5❑	6❑
(4)	personnel with good marketing knowledge were involved in the project team	1❑	2❑	3❑	4❑	5❑	6❑
(5)	senior marketing managers were involved in the project team	1❑	2❑	3❑	4❑	5❑	7❑
(6)	support from the top management was strong	1❑	2❑	3❑	4❑	5❑	7❑

26.	Still referring to the segmentation part of this market study, to what extent do you agree with the following statements about your company?	Strongly disagree		Neither disagree nor agree		Strongly agree	Don't know
(7)	the internal communications within the team were good	1❑	2❑	3❑	4❑	5❑	6❑
(8)	the morale of the team members was high	1❑	2❑	3❑	4❑	5❑	6❑
(9)	the budget for conducting the project was adequate	1❑	2❑	3❑	4❑	5❑	6❑
(10)	sufficient time was available for the project	1❑	2❑	3❑	4❑	5❑	6❑
(11)	research was conducted to collect market/customer data	1❑	2❑	3❑	4❑	5❑	6❑
(12)	detailed information about competitors was collected	1❑	2❑	3❑	4❑	5❑	6❑
(13)	statistical packages were used to analyse market/ customer data	1❑	2❑	3❑	4❑	5❑	6❑
(14)	customers' needs were well understood	1❑	2❑	3❑	4❑	5❑	6❑
(15)	different methods were used to divide the customers	1❑	2❑	3❑	4❑	5❑	6❑
(16)	customers with similar needs were grouped together	1❑	2❑	3❑	4❑	5❑	6❑
(17)	the attractiveness of each customer group was evaluated	1❑	2❑	3❑	4❑	5❑	6❑
(18)	a systematic way of selecting target customer groups was used	1❑	2❑	3❑	4❑	5❑	6❑
(19)	market opportunities and threats were analysed	1❑	2❑	3❑	4❑	5❑	6❑
(20)	your company's strengths and weaknesses were analysed	1❑	2❑	3❑	4❑	5❑	6❑
(21)	your company's ability to fulfil the needs of the customers in the selected target markets was evident	1❑	2❑	3❑	4❑	5❑	6❑
(22)	customer profiles were clearly defined	1❑	2❑	3❑	4❑	5❑	6❑
(23)	the ways to compete in the selected target markets were clearly decided	1❑	2❑	3❑	4❑	5❑	6❑
(24)	the project results could easily be translated into actionable marketing activities	1❑	2❑	3❑	4❑	5❑	6❑
(25)	the project results led to a reallocation of resources within the company	1❑	2❑	3❑	4❑	5❑	6❑
(26)	marketing mix (product, price, promotion and distribution) decisions were based on the results of the project	1❑	2❑	3❑	4❑	5❑	6❑
(27)	regular meetings were held to monitor progress	1❑	2❑	3❑	4❑	5❑	6❑
(28)	surveys were conducted to assess customers' opinions about the product/service	1❑	2❑	3❑	4❑	5❑	6❑
(29)	the market situation was reviewed regularly	1❑	2❑	3❑	4❑	5❑	6❑
(30)	the success of the project in meeting the objectives was reviewed	1❑	2❑	3❑	4❑	5❑	6❑
(31)	the whole process was well documented	1❑	2❑	3❑	4❑	5❑	6❑

27. In your opinion, what were the most difficult elements of the completion and implementation of this segmentation project?

It has been suggested that a segmentation project includes the following stages: ***dividing*** the market, ***selecting*** targets and ***developing*** products/services; although not everybody agrees that all these stages are involved. Questions **28** and **29** ask how far your company intended to follow the three stages, and how far you think your company got in this specific market study.

28.	In terms of segmentation, to what extent do you agree that your company ***wanted*** to:	Strongly disagree	disagree	Neither disagree nor agree	agree	Strongly agree	Don't know
a.	***divide*** the market into two or more groups	1❑	2❑	3❑	4❑	5❑	6❑
b.	***select*** one or more of these groups as your company's target markets	1❑	2❑	3❑	4❑	5❑	6❑
c.	***develop*** the company's products/services and related marketing activities to meet the needs of these selected markets	1❑	2❑	3❑	4❑	5❑	6❑

29.	In terms of segmentation, to what extent did this specific market study ***succeed*** in:	Very unsuccessful		Neither unsuccessful nor successful		Very successful	Don't know
a.	***dividing*** the market into two or more groups	1❑	2❑	3❑	4❑	5❑	6❑
b.	***selecting*** one or more of these groups as your company's target markets	1❑	2❑	3❑	4❑	5❑	6❑
c.	***developing*** the company's products/services and related marketing activities to meet the needs of these selected markets	1❑	2❑	3❑	4❑	5❑	6❑

30. Within the context of question **29**, how have you been able to measure the success of the three stages?

	Please indicate the success of the following:	Very unsuccessful		Neither unsuccessful nor successful		Very successful	Don't know
31.	Overall, this segmentation project was:	1❑	2❑	3❑	4❑	5❑	6❑
32.	The sales of the specific product/service being studied turned out to be:	1❑	2❑	3❑	4❑	5❑	6❑

33. In question **31**, ***why particularly*** do you think this specific segmentation project was successful/ unsuccessful?

34. If you are interested in receiving a report of the research findings, please put your name/address here (or enclose on a separate sheet). This information will be used only for the purposes of this study.

Name: Mr/Mrs/Ms_____
Address:

The end! Please return this questionnaire, in the envelope provided, to: ***1994 Segmentation Survey, Marketing & Strategic Management, Warwick Business School, University of Warwick, Coventry CV4 7AL.*** If you have any other comments, please feel free to use the space below or the back of the paper. **Thank you for all your help and cooperation. All responses will be kept strictly confidential.**

Appendix 5. A Questionnaire Response Letter

(Company Name)

1994 Segmentation Survey
MSM, SIBS
Warwick Business School
Coventry
CV4 7AL

Dear Sir

We have received your questionnaire for the 1994 Segmentation Survey and would be pleased to complete it once you have provided us with some background information as to the objective of this study and the scope of its coverage.

You will appreciate that we are approached by a very large number of organisations trying to prepare such studies, most of which we never benefit from nor ever see any results.

We are, however, very pleased to supply universities and academic studies and accordingly would request you to provide us with a full background of the activity so that we may in all good faith support you.

Yours faithfully,

Appendix 6. Request for Questionnaire Completion

Contact Company

Date

Dear (Contact Person)

Thank you very much for filling in and sending back the 1994 Segmentation questionnaire. Your responses have been very useful to the survey, especially the comments that you have made.

There are, however, certain questions (15, 26 and 27) that you did not complete. I would be very grateful if you could fill these in and return them to me by the envelope provided. Once again thank you for your co-operation.

Yours sincerely

Tom M. Y. Lin

MSM, SIBS
Research Student
Warwick Business School
Tel: (01203) 524650
Fax: (01203) 523719

Appendix 7. Additional Hypotheses Testing

Apart from the main hypotheses which investigate the relationships between segmentation activities and segmentation success, there are still many others tested in this research. Though minor, compared with the main hypotheses, they are briefly discussed here.

A7.1 Perception of Segmentation Objectives

In section 5.2.1, respondents' perceptions of segmentation objectives were summarised and it was found that *market selection* appeared to be the most widely recognised objective of a segmentation project. It would be interesting to know if the perception of segmentation objectives differs across industries and amongst people with different job titles. Table A7-1 presents the ANOVA results of the differences perceived by respondents from different industries and with different job titles. The results show that there is no difference in perceptions between people from different industries. As for people with different job titles, apart from the Q.13a (understanding customers' behaviour and needs as the main objective of a segmentation project), there appears to be no significant difference in perception.

Table A7-1 Perception of Segmentation Objectives (ANOVA)

Q.13	The main objectives of a segmentation project are to:	Significance level (across industries)	Significance level (across job titles)
a.	Understand customers' behaviour and needs	0.91	0.03 *
b.	Understand market situations	0.36	0.25
c.	Analyse competitors	0.53	0.66
d.	Select the most suitable segments	0.40	0.30
e.	Facilitate the development of marketing plans	0.50	0.54
f.	Maximise use of company resources	0.57	0.51
g.	Select major product features to emphasise	0.33	0.42
h.	Determine the price of a product	0.17	0.67
i.	Develop an advertising campaign	0.22	0.92
j.	Choose a distribution channel	0.40	0.31

* Significant at the 95% level

A7.2 Perception of Segmentation Usefulness

In section 5.2.2, of the 212 respondents, 138 considered segmentation beneficial to their companies, while 34 considered it not. It would be interesting to see if this belief holds for people from different industries and job titles. Table A7-2 presents the results of χ^2 tests, showing that the perception of segmentation usefulness is not influenced by different industries and by different job titles.

Table A7-2 Perception of Segmentation Usefulness (χ^2)

Q.16	Do you think segmentation is beneficial to your company?	Significance level
Q.3	Different industries	0.31
Q.12	People of different job titles	0.80

A7.3 Differences in Understanding and Adoption

In section 5.2.3, the study showed that segmentation concepts may not be well understood by practitioners. The ANOVA results in Table A7-3 show this lack of knowledge does not differ across industries.

Table A7-3 Segmentation Understanding & Adoption (ANOVA)

Q.18	Segmentation concepts are understood (adopted) by:	Significance level (across industries)
a.	Top management in your company	0.56
b.	Marketing people in your company	0.16
c.	Product designing people in your company	0.95
d.	Your industry	0.46
e.	Companies in your industry in their marketing planning	0.50

Although low knowledge level may be a barrier to segmentation adoption, if the problem is identified, it can then be solved by training programmes. With a higher level of understanding, a company can become a more successful adopter of segmentation strategy, as shown below.

A7.4 Differences in Segmentation Experience

Table A7-4 shows that a company's experience of segmentation is significantly associated with some of the company's demographics. Specifically, the experience is associated with: the number of the employees, industry type and company turnover. Moreover, it is also associated with knowledge about segmentation of the top management, marketing people and people in the industry in general.

Table A7-4 Experience of Segmentation (χ^2)

	Company segmentation experience	Significance level
Q.2	Different number of company employees	0.02 *
Q.3	Across industry	0.03 *
Q.6	Different company turnover	0.02 *
Q.18a	Segmentation knowledge of the top management	0.00 **
Q.18b	Segmentation knowledge of the marketing people	0.03 *
Q.18d	Segmentation knowledge of the people in the industry	0.02 *

* Significant at the 95% level
** Significant at the 99% level

A7.4.1 Demographics and Segmentation Experience

A further investigation shows that the larger the scale of the company, the more likely it is to have segmentation experience (Table A7-5 and Table A7-7). Table A7-6 shows that segmentation experience differs across industries. Owing to the small sample size, however, it may be premature to conclude that one industry has more segmentation experience than the others.

Table A7-5 Company Employee Numbers & Segmentation Experience

Q.2	Company employee numbers	Frequency	Having experience	%
1.	20 or fewer	90	30	33.3
2.	21-49	32	10	31.3
3.	50-99	24	13	54.2
4.	100-499	33	17	51.5
5.	500-999	5	3	60.0
6.	1,000 or more	4	4	100.0

Table A7-6 Industry Types & Segmentation Experience

Q.3	Industry	Frequency	Having experience	%
1.	Homeware	32	5	15.6
2.	Water & Effluent Treatment	40	17	42.5
3.	Rooftec & Building Fabric	9	5	55.6
4.	Furniture	24	7	29.2
5.	Wood Machinery	8	5	62.5
6.	Software Development	18	9	50.7
7.	Tooling	13	8	61.5
8.	Manufacturing	44	21	47.7

Table A7-7 Company Turnover & Segmentation Experience

Q.6	Turnover per annum	Frequency	Having experience	%
1.	Under £1 million	67	19	28.4
2.	£1 - £9 million	83	39	47.0
3.	£10 - £49 million	20	9	45.0
4.	£50 - £99 million	5	2	40.0
5.	Over £100 million	4	4	100.0

A7.4.2 Knowledge and Segmentation Experience

The significant results of χ^2 tests and visual inspection of the data indicated that the better the segmentation knowledge of the top management, the marketing people and people in the industry, the more likely the company will have segmentation experience, and vice versa. Although it is hard to draw a cause-and-effect relationship between segmentation knowledge and segmentation adoption, the results in Table A7-8 do suggest that they are closely associated.

Table A7-8 Segmentation Knowledge & Experience

People in the company or in the industry	Knowledge of segmentation	No experience	Experienced	χ^2 significance level
Q.18a Top management	Not knowledgeable	64 ↘	28	0.00 **
	Knowledgeable	34	45	
Q.18b Marketing people	Not knowledgeable	41 ↘	21	0.03 *
	Knowledgeable	53	55	
Q.18d People in the industry in general	Not knowledgeable	73 ↘	39	0.02 *
	Knowledgeable	23	27	

* Significant at the 95% level
** Significant at the 99% level
Shaded areas and ↘ show the direction of association

A further investigation of Table A7-8 shows that there were many companies (upper-right cells) with knowledgeable top management and company staff but with no experience of segmentation. This implies that for segmentation, knowledge is one thing and doing is another. The fact that many companies are knowledgeable about segmentation and yet have no experience of it suggests that companies may not have a strong intention of adopting this marketing concept, or that the benefits of segmentation may not be recognised.

On the other hand, as Achenbaum (1974: 11) claimed, "Many of the researchers doing segmentation research just don't know what the concept is all about," Table A7-8 also shows that many projects (lower-left cells) were undertaken by the type of companies whose staff, despite experience of conducting a segmentation project, did not know much about segmentation.

A7.5 Differences in Degrees of Implementation

Table A7-9 summarises the ANOVA tests between company demographics and their scores for the ten factors extracted from the 31 segmentation activities. In general, company demographics do not have significant influence on the degree of implementation of a company's segmentation project.

Table A7-9 Company Demographics & Degrees of Implementation (ANOVA)

Factor	Q.1	Q.2	Q.3	Q.6	Q.7	Q.9	Q.10
1. Quality results	0.24	0.44	0.46	0.27	0.85	0.08	0.69
2. Action on results	0.04 *	0.34	0.97	0.67	0.94	0.04 *	0.39
3. Management support	0.70	0.69	0.62	0.43	0.14	0.23	0.99
4. Adequate project resources	0.39	0.18	0.69	0.33	0.48	0.90	0.07
5. SWOT analysis	0.72	0.29	0.74	0.91	0.34	0.99	0.68
6. Formality	0.11	0.63	0.17	0.97	0.57	0.41	0.97
7. Customer group selection	0.30	0.35	0.78	0.19	0.78	0.01 **	0.68
8. The use of statistical packages	0.17	0.57	0.69	0.73	0.91	0.42	0.33
9. Morale and communication	0.33	0.25	0.24	0.74	0.43	0.87	0.17
10. Knowledge of customer	0.37	0.24	0.65	0.42	0.32	0.91	0.28

Q.1 Company operating years
Q.2 Number of employees
Q.3 Industry type
Q.6 Company's turnover
Q.7 Company's ownership
Q.9 Number of customers
Q.10 Customers contacted

* Significant at the 95% level
** Significant at the 99% level

Table A7-10 shows the correlation between top management's and marketing people's segmentation knowledge and segmentation factors. In general, the knowledge of top management and marketing people has considerable impact on the *plan* (factors 6, 3 and 9) and *action* (factors 1 and 2) stages, whereas in the *fieldwork* stage (factors 4, 8, 10, 7 and 5), none of these seemed to be influential.

Table A7-10 Correlations of Knowledge and Segmentation Factors

	Knowledge of	
Factor	Top management	Marketing people
1. Quality results	0.34 **	0.26 *
2. Action on results	0.19	0.30 **
3. Management support	0.32 **	0.30 **
4. Adequate project resources	0.19	0.13
5. SWOT analysis	0.17	0.05
6. Formality	0.01	0.03
7. Customer group selection	0.12	0.16
8. The use of statistical packages	-0.07	0.12
9. Morale and communication	0.38 **	0.31 **
10. Knowledge of customer	0.21	0.11

* Significant at the 95% level

** Significant at the 99% level

A7.6 Differences in Segmentation Success

Using mean understanding value as a cutting point, Table A7-11 presents the results of the *Student's t* test comparing the mean value of the low degree group (not knowledgeable) against the mean value of the high degree group (knowledgeable). It was found that the different degree of understanding amongst the top management, marketing people, and product design people was significantly associated with segmentation success. Table A7-11 shows that companies with more knowledgeable staff tended to have higher success scores. Therefore, segmentation training and education to ensure having knowledgeable staff might be a good way of achieving successful segmentation.

Table A7-11 Impact of Low and High Understanding Groups on Segmentation Success

Q.18. Understanding and Adoption of Segmentation Concepts	Not Knowledgeable	Knowledgeable	Mean Difference	Significance Level
a. Top management	3.22	3.98	0.76	0.00 **
b. Marketing people	3.13	3.91	0.78	0.00 **
c. Product design people	3.40	4.19	0.79	0.00 **
d. Industry	3.50	3.96	0.46	0.04 *
e. Adopted in the industry	3.52	3.86	0.33	0.22

* Significant at the 95% level
** Significant at the 99% level

Table A7-12 shows that the likelihood of segmentation success was much the same in the *very new*, *young* and *mature* stages of a product's life cycle. For *ageing* products, the success score was significantly lower. Although the difference between ageing products and the other three stages of PLC was statistically significant, it may be premature to conclude that segmentation projects for ageing products have little chance of success, as the sample size of ageing products in this research was very small (only 4).

Table A7-12 Product Life Cycle & Segmentation Success

Q.23 Product life cycle	Frequency *	%	Success Score	Significance Level
1. Very new	16	21.6	4.07	**1-4** **
2. Young	23	31.1	3.45	**2-4** **
3. Mature	31	41.9	3.86	**3-4** **
4. Ageing	4	5.4	2.25	-
Total	74	100.0	-	-

No significant difference between groups 1, 2, and 3
** Significant at the 99% level

Table A7-13 shows the correlation coefficients between ***STP*** (*segmenting*, *targeting* and *positioning*) and segmentation and sales success. The division of segmentation into the ***STP*** process, suggested by Kotler (1991: 263), is agreed upon by many academics (Plank 1985: 80). However little has been done to investigate the impact of each stage of the ***STP*** process on segmentation success. By calculating the correlation coefficients of the three stages, this research shows that all of them have a strong impact on segmentation and sales success.

Table A7-13 Correlation of *STP* and Segmentation & Sales Success

	Success of		
	Segmenting	Targeting	Positioning
Segmentation Success	0.64 **	0.67 **	0.77 **
Sales Success	0.44 **	0.48 **	0.55 **

** Significant at the 99% level

Appendix 8. Summary for Sending to Questionnaire Respondents

Results of the "1994 Segmentation Survey"

Dear Sir,

About one and a half years ago we invited you to participate in the Warwick Business School "1994 Segmentation Survey," the purpose of which was to examine how companies segment their markets and to discover the factors that affect the success of a segmentation project. We appreciate very much your involvement in this research and are glad to be able to share with you some of the results, as we promised.

The main findings of the research are four-fold. *First*, in general, there are three stages in a segmentation process. These are the *plan*, *fieldwork* and *action* stages. The *Action* stage has the greatest impact on segmentation success (68%), followed by *plan* (41%) and *fieldwork* (24%). For example, the different emphasis (strong or weak) on the *plan* stage of a segmentation project will result in 41% difference in segmentation success rates, that is, 80.5% for the *plan* strongly-oriented projects and 39.5% for the weakly-oriented ones.

Secondly, in each of the stages, there are several factors which greatly impact upon segmentation projects. These factors deserve management's special attention and include:

- in the *plan* stage: management support of the segmentation project and morale and communication within the project team.
- in the *fieldwork* stage: adequate project resources, knowledge of the customer and the selection of the customer groups as company targets.
- in the *action* stage: quality of the project results, and action based on the project results.

Thirdly, the research finds that company staff's knowledge level of segmentation seems to be strongly associated with segmentation success. It should be a good investment for a company to have a segmentation-related training programme for its employees.

Fourthly, and perhaps the most practical suggestion, is that a company need not go through the *plan*, *fieldwork* and *action* stages so as to make the best use of the segmentation concept. That is, a company does not have to wait until all the necessary market information is gathered before it can put segmentation into practice. For many companies, a small amount of information plus some experience and judgement may be more than enough for taking the first step towards segmentation action.

These are the main findings from the "1994 Segmentation Survey." We hope you find them useful. Once again, many thanks for your cooperation.

With best regards,

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